Hydro Québec

SUSTAINABILITY REPORT 2014

HYDRO-QUÉBEC

Hydro-Québec generates, transmits and distributes electricity. Its sole shareholder is the Québec government. While using mainly hydroelectric generation, it supports the development of other technologies—such as wind energy and biomass—through purchases from independent power producers. It also conducts R&D in energy-related fields, including energy efficiency. The company has four divisions:

HYDRO-QUÉBEC PRODUCTION

generates power for the Québec market and sells power on wholesale markets.

HYDRO-QUÉBEC TRANSÉNERGIE

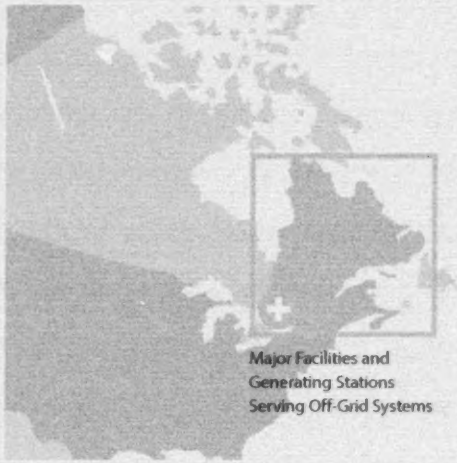
operates the most extensive transmission system in North America for the benefit of customers inside and outside Québec.

HYDRO-QUÉBEC DISTRIBUTION

provides Quebecers with a reliable supply of electricity. To meet needs beyond the heritage pool, which Hydro-Québec Production is obligated to supply, it mainly uses a tendering process. The division also encourages its customers to make efficient use of electricity.

HYDRO-QUÉBEC ÉQUIPEMENT ET SERVICES PARTAGÉS

and Société d'énergie de la Baie James (SEBJ), a subsidiary of Hydro-Québec, design, build and refurbish generating and transmission facilities, mainly for Hydro-Québec Production and Hydro-Québec TransÉnergie.



Major Facilities and Generating Stations Serving Off-Grid Systems

Above Les Cèdres generating station, archive photos.

On the cover Les Cèdres generating station, a run-of-river plant, located on the Saint-Laurent (St. Lawrence River), in Montérégie. The newly refurbished facility opened its doors to the public for its 100th anniversary this year. It is the second-oldest hydroelectric generating station in Québec.

When it was built in 1914, it was the first generating station designed to export part of its output to the United States. For a long time, it was the most powerful facility in Québec. About 15 years ago, a bicycle path was added along several of its retaining structures, offering riders splendid panoramic views.

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OUR APPROACH

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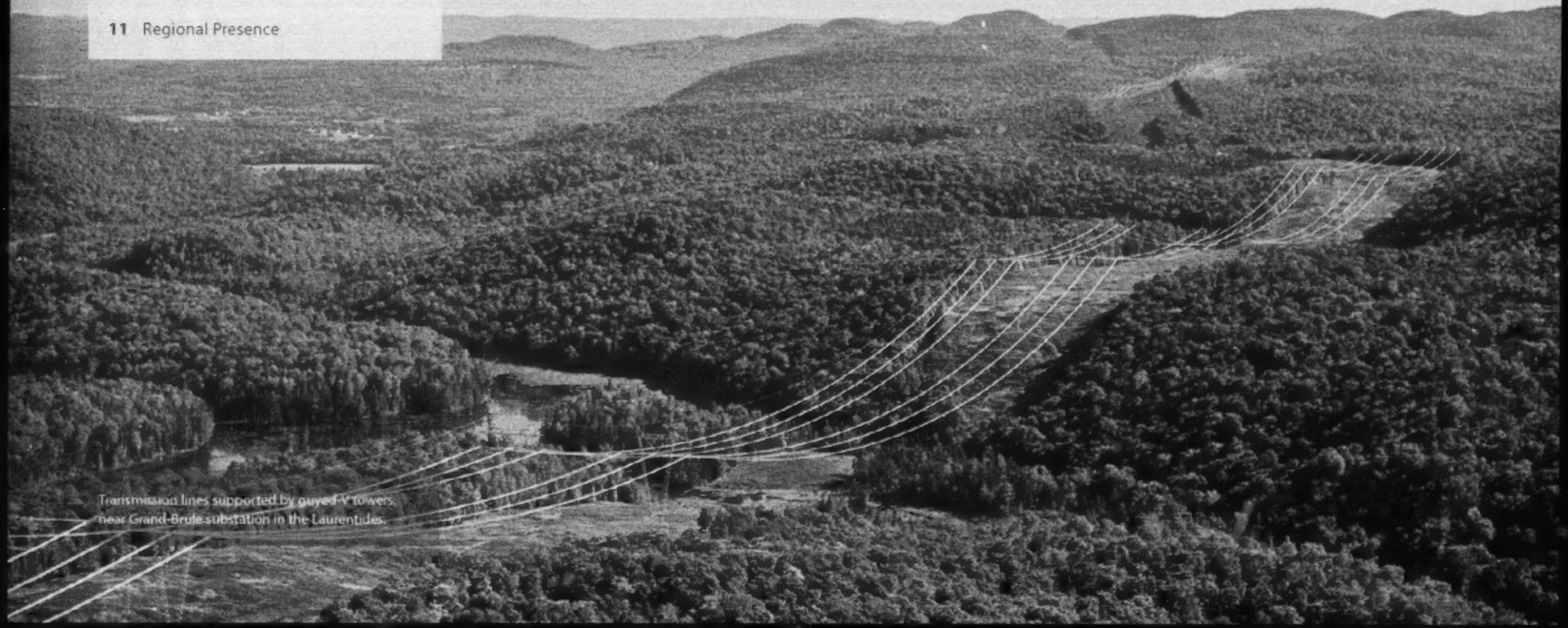
Hydropower enables Hydro-Québec to contribute to the well-being of Quebecers on a daily basis. We are also deeply concerned about ensuring the energy future of coming generations, and consequently look after resources and the environment.

Québec's decision to develop hydropower is more relevant than ever at this time of distinct climate change. Hydropower is a clean, renewable energy source with known, well-controlled environmental impacts. It allows the province to position itself favorably in terms of greenhouse gas emissions relative to the rest of North America.

Sustainability is vital to our industry. In addition to environmental protection, it encompasses issues of social progress and economic performance, and is at the root of all our decisions and projects.



Transmission lines supported by guyed-V towers near Grand-Brûlé substation in the Laurentides.

INTERVIEW WITH THIERRY VANDAL, PRESIDENT AND CHIEF EXECUTIVE OFFICER

Beyond its main commitments, what concrete steps does Hydro-Québec take to implement sustainability?

First of all, our growth projects must fulfill our commitment to sustainability. They must be favorably received by the host communities while representing an excellent environmental and economic option. Hydro-Québec also works toward concrete, measurable targets laid out in its Sustainable Development Action Plan. The Action Plan, which comprises 10 actions that support Québec's Government Sustainable Development Strategy, sets the company's priorities in a variety of areas, ranging from renewable energies, energy efficiency and environmental responsibility to support for low-income customers. This report is an important component in our process of reporting on concrete achievements in the area of sustainability. It meets stringent standards for reporting and contains a large number of indicators for measuring the progress made. Moreover, the materiality of the report content is assessed periodically with stakeholders.

What stands out in 2014 in terms of sustainability?

Shale gas production continued to outpace demand, leading to a decline in North American natural gas prices. In Québec, electricity accounts for over 40% of the energy balance, and nearly 99% of the electricity generated and purchased by Hydro-Québec comes from renewable energy sources. As a result, the province can boast one of the lowest greenhouse gas emission rates per capita in North America. In 2014, the company reached a new milestone in improving Québec's energy efficiency: we met the target of 8 TWh set in our Energy Efficiency Plan a year earlier than expected, and even surpassed it, for a cumulative total of 8.2 TWh compared with 2003 consumption.

At the same time, Hydro-Québec has continued to pursue the development of renewables. At the Romaine complex, in Côte-Nord, we commissioned Romaine-2 generating station, adding 640 MW to our generating capacity while boosting regional economic activity as well. In the regions nearby, seven wind farms went into operation. The acquisition of several hundred megawatts of firm capacity will also be required to fill needs in coming winters.

On our off-grid systems, an unfortunate incident occurred at the thermal generating station at Cap-aux-Meules on Îles de la Madeleine. Hydro-Québec quickly assumed its responsibilities and took measures to contain the spill of diesel from the pipeline and implement recovery procedures right away. We did everything possible to prevent environmental damage and worked closely with the municipality, the local associations concerned and federal and provincial authorities to remedy the situation.

As regards customer service, our advanced metering infrastructure rollout made steady progress, with more than 2.5 million next-generation meters—out of a total 3.8 million—installed as at December 31, 2014. This project should be completed by the end of 2016.

From a sustainability standpoint, installing these remotely read meters means that we can avoid several hundred tonnes of greenhouse gas emissions every year by taking many vehicles used for meter reading off the road.

This year, Hydro-Québec recorded the best result from continuing operations in its history—$3.4 billion—enabling us to pay a record dividend of $2.5 billion to our shareholder, the Québec government. This result, which represents 15% growth compared with 2013, is attributable to the solid performance shown in all our lines of business during a year marked by cold weather that hit both Québec and outside markets early on, and to sound management of our operating expenses.

What will be the main issues facing Hydro-Québec in 2015?

The recent start-up of Romaine-2 generating station and its transmission facilities will give the company greater flexibility in meeting continued growth in capacity needs.

The commissioning of Romaine-1 in 2015 will be just as essential. Bringing the new power and energy to load centres calls for a number of transmission facilities to be completed. Notable among these major undertakings is the start of construction on the $1-billion Chamouchouane–Bout-de-l'Île project, designed to further strengthen the metropolitan loop and the system in south Lanaudière.

Various other transmission line projects will need to be proposed and approved in the coming years, meaning that the issue of social acceptability will have to be addressed. Our teams maintain close relations with host communities all across Québec so that we can agree on variants or developments that are supported by a majority of stakeholders. Throughout this exercise, Hydro-Québec must find a balance between the degree of acceptability required, costs and environmental impacts, as well as the economic and social spinoffs of the project.

In another area, 2015 could yield the first results of technology agreements signed with different partners. For example, the joint venture we launched with the Japanese-based Sony will start work on designing large-scale energy storage systems for power grids. Prestolite E-Propulsion Systems, a joint venture between our subsidiary TM4 and a Chinese partner, Prestolite Electric (Beijing), will begin delivering the SUMO systems developed by TM4, which have been selected by two major Chinese bus manufacturers.

Finally, the fact that Hydro-Québec is a profitable company, on the leading edge of technology, well regarded the world over by its peers, and that continues to grow, can be credited to the innovation that goes on every day throughout the company. In a world where resources are limited, there can be no sustainable development without technological innovation. And in economic terms, it ensures productivity gains. The outstanding performance posted once again this year is made possible by the expertise, professionalism and determination of all our employees, who are steadfast in their daily efforts to create value for Québec.

ABOUT THIS REPORT

The *Sustainability Report 2014* describes Hydro-Québec's performance with respect to its main environmental, social, economic and governance issues. This edition, published in May 2015, is the thirteenth such report produced by Hydro-Québec.

SCOPE

The *Sustainability Report 2014* largely addresses the issues and impacts of Hydro-Québec's activities in Québec from January to December 2014.

NEW FEATURES

- Presentation of the approach and results of the materiality analysis conducted with stakeholders in fall 2014. (p. 7)
- Introduction of a section titled Regional Presence that summarizes Hydro-Québec's activities in the province's various administrative regions. (p. 11)
- Presentation of the results of the comparison of generating options based on life cycle analysis. (p. 20, 21)
- Preparation of the report according to the new Global Reporting Initiative G4 guidelines, based on the "core" compliance option. (p. 72)

COMMUNICATION TOOLS

To reach the largest possible number of stakeholders, Hydro-Québec employs various tools for communicating and reporting on its sustainability:

- *Sustainability Report 2014*
- A sustainable development Web site containing further details
- A brochure presenting 2014 sustainability highlights, also available in ePub fixed-layout format for tablets, allowing an interactive version to be viewed
- *Sustainable Development Action Plan 2013–2016*
- A section of the *Annual Report 2014* dedicated to sustainability
- Videos
- Presentations at various forums (exhibitions, universities, conferences, symposiums, etc.)

APPLICATION OF RECOGNIZED STANDARDS

Stakeholders expect Hydro-Québec's Sustainability Report to be complete, and that the information presented should be accurate and balanced. Accordingly, this report draws on the Global Reporting Initiative (GRI) G4 guidelines and Electric Utilities Sector Supplement, based on the "core" compliance option. These standards ensure the credibility and quality of sustainability reporting. Readers can consult the partial GRI index on page 72 of this report or the complete index in the Global Reporting Initiative (GRI) section of Hydro-Québec's Web site.

The information contained in this report has been carefully gathered and validated. In addition, an outside firm conducted an independent evaluation of some quantitative data and verified compliance with the *AA1000APS AccountAbility Principles Standard* (2008). Verified data are accompanied by the symbol ✓. The independent assurance statement is supplied on page 76.

EXCLUSIVE WEB CONTENT

- Hydro-Québec's GRI compliance

GRI G4-18, G4-19, G4-20, G4-21, G4-23, G4-25, G4-26

MATERIALITY ANALYSIS

The materiality analysis is central to determining the content of Hydro-Québec's Sustainability Report. This means that the report must cover the topics that are of the greatest materiality to the company as regards its business environment, the nature of its operations and its economic, environmental and social impacts. This exercise cannot be performed without the participation of both internal and external stakeholders. Hydro-Québec's materiality analysis was carried out in four stages.

IDENTIFICATION

The first stage called for updating the list of sustainability aspects related to Hydro-Québec's operations and to their impacts. Various internal and external information sources were used for this, including:

- Results of the consultation exercise conducted in 2011 for the *Sustainability Report 2011*
- Results of the survey of stakeholder satisfaction carried out following publication of the *Sustainability Report 2012*
- Material Aspects of the Global Reporting Initiative and its Electric Utilities Sector Supplement
- Analyses of energy industry aspects, such as those produced by the Electric Power Research Institute, International Hydropower Association and Canadian Electricity Association
- A benchmarking analysis of aspects discussed by three other companies in the energy industry
- The company's strategic priorities
- The *Sustainable Development Action Plan 2013–2016*

This stage yielded a definition of 34 aspects related to sustainability and of their boundaries based on where the impacts occur (p. 80).

A definition was drawn up for each of the aspects to ensure a common understanding. Hydro-Québec also updated its list of stakeholders, using the following major categories:

- Industry associations
- Other government corporations
- Customers
- Aboriginal communities
- Local communities
- Suppliers
- Media
- Not-for-profit organizations
- Economic partners
- Government
- Universities

PRIORITIZATION

Hydro-Québec then prioritized its stakeholders, based on this new list. Priority stakeholders were identified according to three criteria: influence, impact and responsibility. Various consultation methods were employed, depending on the different categories: a survey for all stakeholders and discussion sessions for priority stakeholders.

In September 2014, an electronic survey was conducted of the stakeholders identified to assess the relative importance of each aspect, based on their information requirements. This exercise enabled the company to determine the aspects it should elaborate further in the Sustainability Report.

Out of 250 invitations issued to take part in the survey, 91 organizations and 57 Hydro-Québec managers and employees responded. The survey results are shown in the Materiality Matrix, which illustrates the findings of the Hydro-Québec assessment and of the assessment made by stakeholders. Aspect definitions and boundaries are presented on page 80.

GRI G4-18, G4-19, G4-20, G4-21, G4-23, G4-26, G4-27

VALIDATION

Based on the stakeholder prioritization, three discussion sessions with external stakeholders were held in 2014; in all, 27 organizations took part. One session was also held in October with 11 representatives of Hydro-Québec's divisions. At these sessions, the internal and external stakeholders expressed their views of the survey results. In their opinion, the results accurately reflected the positive and negative impacts of Hydro-Québec operations. The participants went on to specify the type of information they would like to receive, namely: strictly qualitative information, quantitative information including historic trends, comparison with peers, etc. Special attention was paid to the eight most material aspects in order to determine the nature of the information expected by stakeholders.

Additional aspects proposed by the survey respondents were also discussed. The participants suggested that five of them, which were deemed material, be covered in the next materiality analysis: the carbon market, the company's processes for internalizing environment-related costs, impact assessments and environmental follow-ups for major projects, resource consumption for infrastructures (steel, concrete, etc.) and a comparison, whenever possible, between Hydro-Québec's performance and that of similar companies in other regions, or between hydropower and other energy options.

REVIEW

In November 2013, Hydro-Québec surveyed stakeholders to ascertain whether the structure and content of the *Sustainability Report 2012* met their expectations. More than 93% of respondents stated that they were completely or fairly satisfied with the structure of the report, with an overall satisfaction rate of 7.7 out of 10 as regards the content. Their comments and suggestions were taken into account in the new materiality analysis.

A satisfaction survey was conducted of participants in the sessions held in 2014. Close to 96% of them were satisfied or very satisfied with the survey, while 96% also found their participation in the discussion session to be relevant. Hydro-Québec will verify the satisfaction of stakeholders consulted in 2014 following publication of the *Sustainability Report 2014* to ensure that the new report meets their expectations.

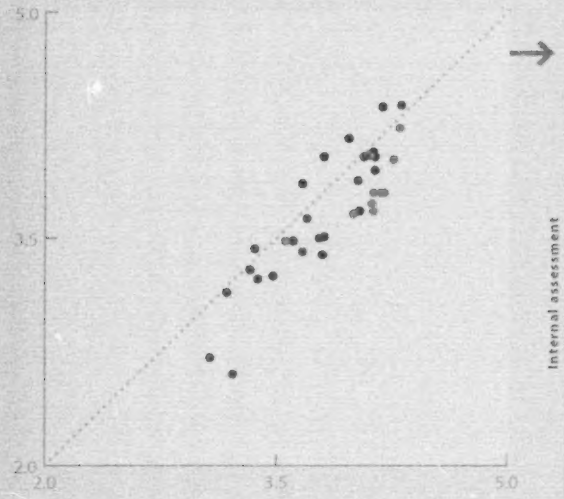
REVIEW OF STAKEHOLDER CONSULTATION EXERCISE

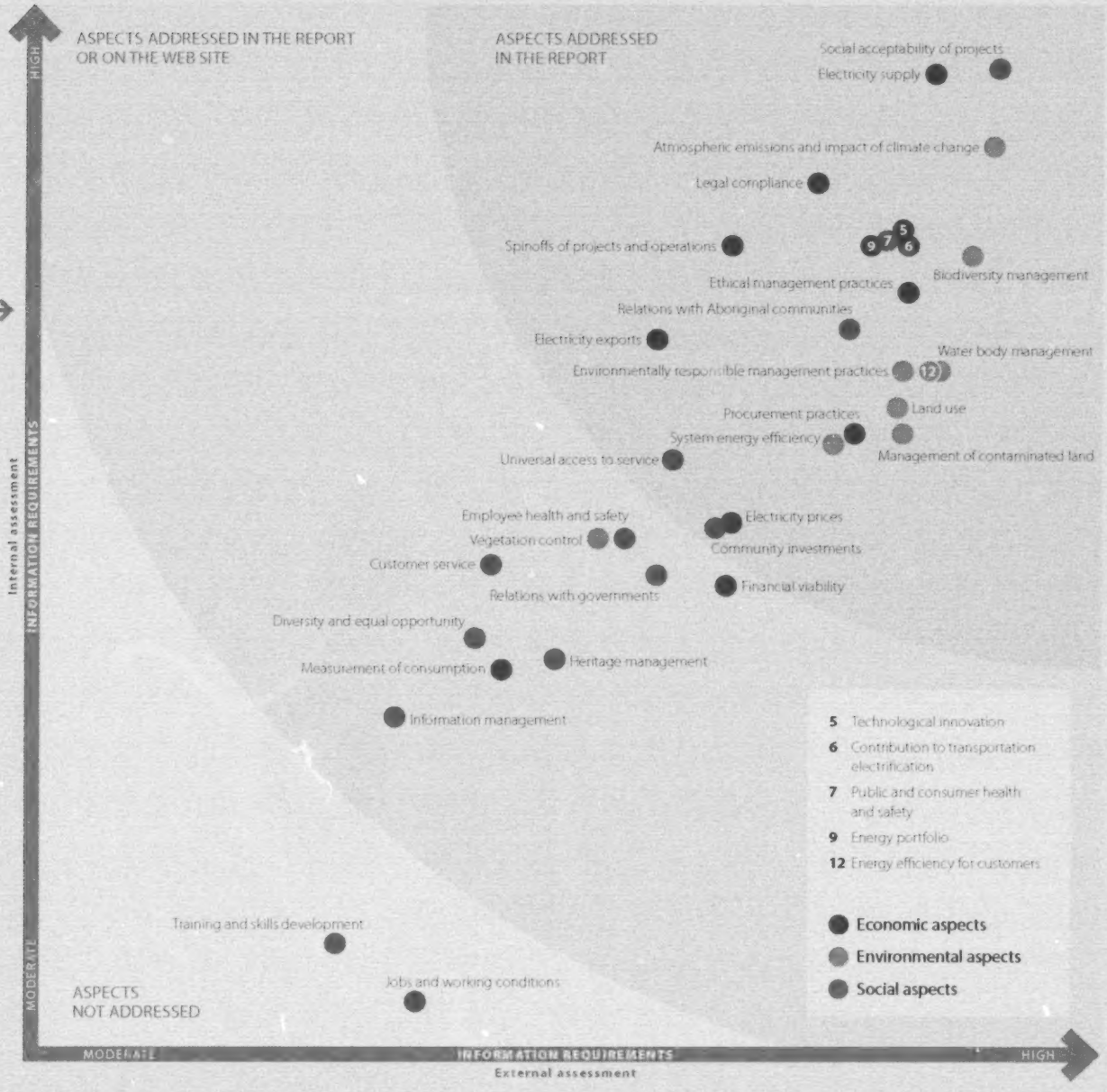
In fall 2014, Raymond Chabot Grant Thornton assisted Hydro-Québec in carrying out its materiality analysis. Our team worked with Hydro-Québec to update its list of sustainability aspects and its list of stakeholders, and to conduct a survey of a group of representative stakeholders in order to prioritize the aspects. We then led discussion sessions with external stakeholders and a session with Hydro-Québec managers and employees so as to elaborate on the results obtained and better define the expectations expressed. The foregoing description of the various stages is fully consistent with the work performed.

Johanne Gélinas, Partner, Raymond Chabot Grant Thornton

GRI G4-18, G4-19, G4-20, G4-21, G4-23

MATERIALITY MATRIX





GRI G4-17

VALUE CHAIN

The value chain includes all activities that create value, from product design to service provision. At Hydro-Québec, we integrate criteria for environmental protection, social acceptability and economic development into every link in this chain.

CONSTRUCTION AND SHARED SERVICES | GENERATION | TRANSMISSION | DISTRIBUTION AND CUSTOMER SERVICE | TECHNOLOGICAL INNOVATION | MANAGEMENT AND SUPPORT OF OUR BUSINESS UNITS

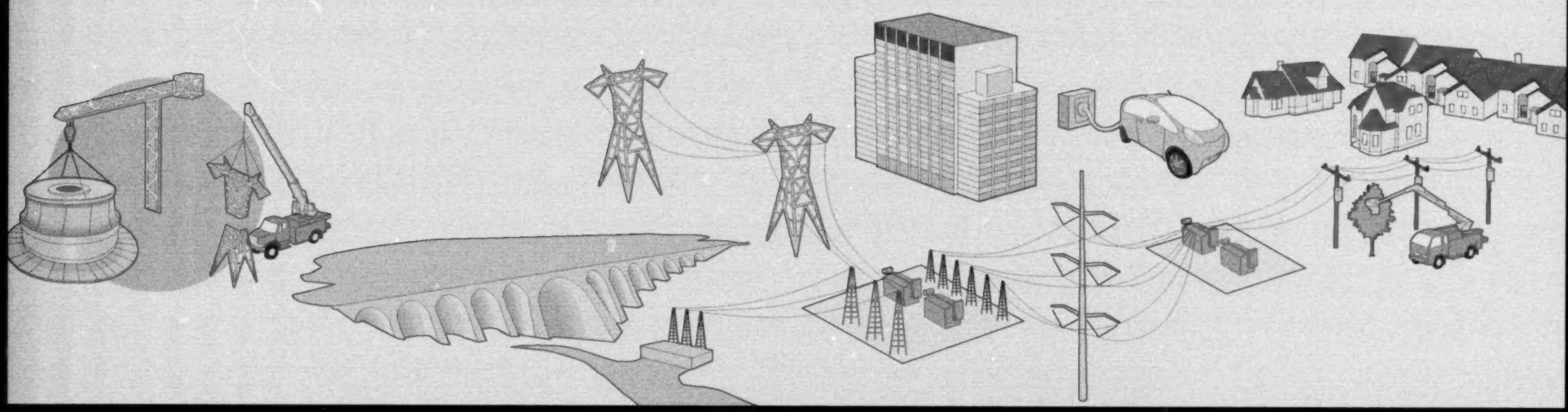
CONSTRUCTION AND SHARED SERVICES

MAIN ACTIONS

- Prevent and manage environmental impacts
- Contribute to the socioeconomic development of the region and maximize economic spinoffs from projects
- Design and carry out projects in collaboration with local communities
- Complete projects within budget and on schedule
- Practise sustainable procurement, manage buildings and residual materials, provide transportation services and carry out real estate transactions

A FEW FIGURES – 2014

- 3,218 employees, including 76% governed by an environmental management system ✓
- One major hydropower project under construction: the Romaine complex ($6.5 billion)
- More than 1,600 projects, mainly for Hydro-Québec Production and Hydro-Québec TransÉnergie
- Procurement of goods and services: $3.3 billion
- Volume of activity: $2.8 billion



OUR ACTIONS

13 Governance

20 Climate Change, Biodiversity and Environmental Management

27 Demand-Side Management

31 Energy Portfolio

47 Acceptability and Spinoffs from Projects and Operations

52 Responsibility for Electricity Service

56 Technological Innovation

60 Health and Safety

64 Human Resources

66 Investing in the Community

Outardes 4 reservoir in Manicouagan, used for power generation.

GOVERNANCE

Hydro-Québec's head office in Montréal. The company is a leading proponent of sustainability in the electricity industry.

SUSTAINABILITY-ORIENTED GOVERNANCE

Hydro-Québec plays an important role in supporting its sole shareholder, the Québec government, in achieving the goals outlined in its Government Sustainable Development Strategy (in French only). The company supplies Québec with electricity using renewable generating options and promotes energy efficiency (Direction 8 of the Government Strategy). It also manages natural resources responsibly, while protecting biodiversity (Direction 3 of the Government Strategy). Hydro-Québec's sustainability objectives are presented in its Sustainable Development Action Plan. Sustainability governance at Hydro-Québec is based on 13 company policies approved by the Board of Directors. ✔ These policies express commitments and a business culture. The company's sustainability objectives are implemented by various mechanisms, such as our environmental (ISO 14001), health and safety (OHSAS 18001) and quality (ISO 9001) management systems, which also ensure that our policies are strictly applied. Sustainability governance concerns all organizational levels, and the application of the related measures is monitored by the Board of Directors' Environment and Public Affairs Committee.

BEST COMPANY FOR LEADERSHIP

Hydro-Québec won the 2014 IAIR corporate award for Best Company for Leadership – Hydroelectricity, presented by the magazine *IAIR – Excellence in Global Economy and Sustainability*, which is read by thousands of leaders and decision makers in the financial and economic sectors worldwide. This honor recognizes the fact that Hydro-Québec is a major supplier of electricity produced by a clean, renewable energy source.

EXCLUSIVE WEB CONTENT

- Corporate governance
- Annual Report 2014 (Governance)

Analysts and traders at work on the energy trading floor of our head office. Their efforts help the company benefit from the best export market conditions.

RESPONSIBLE PROCUREMENT

To ensure responsible procurement, Hydro-Québec integrates environmental and social criteria into its process for acquiring goods and services. This practice aims to reduce environmental impacts, increase social spinoffs and enhance the economic viability of companies, throughout the life cycle of their products. For the last few years, Hydro-Québec has participated in the responsible procurement activities of ECPAR (Espace québécois de concertation sur les pratiques d'approvisionnement responsable), of which the company is a founding member. We have carried out life cycle assessments for certain products and services, targeted the product groups with the largest environmental impact and drafted product purchasing guides that include sustainability criteria.

SUSTAINABILITY GOVERNANCE

COMMITMENT

- Mission
- Company policies
- Codes of conduct

PLANNING

- Government guidelines
- Strategic planning
- Sustainable Development Action Plan
- Division and group business plans

IMPLEMENTATION

- Management systems (ISO 14001, OHSAS 18001, ISO 9001 (in French only), etc.)
- Environmental assessments (impact statements and internal assessments, in French only)
- Research and development
- Relations with stakeholders
- Internal discussion networks
- Training

ASSESSMENT AND IMPROVEMENT

- Applying sustainability principles (in French only)
- Compliance audits
- Indicators

PERFORMANCE REPORTING

- Internal (annual environmental management review, semiannual reports on environmental compliance)
- External (corporate documents)

MAIN SUSTAINABILITY GOVERNANCE ACTIVITIES

Performance reporting Accountability

BOARD OF DIRECTORS

- **Seven committees, including:** Governance and Ethics, Environment and Public Affairs, Human Resources
- **Approval or review of publications, including:** company policies, code of ethics, Strategic Plan, Business Plan, Annual Report, Sustainability Report

PRESIDENT AND CHIEF EXECUTIVE OFFICER

- **Approval of the following documents:** internal guidelines, Code of Conduct for employees, Sustainable Development Action Plan
- **Annual management reviews pertaining to environment and health and safety**

HYDRO-QUÉBEC ADMINISTRATIVE UNITS

- **Various internal networks discussing issues such as environment and workplace health and safety**
- **Maintenance of certified management systems**
- **Environment and sustainability training**
- **Annual management reviews pertaining to environment**

WHAT ROLE DOES THE ENVIRONMENT AND PUBLIC AFFAIRS COMMITTEE PLAY?

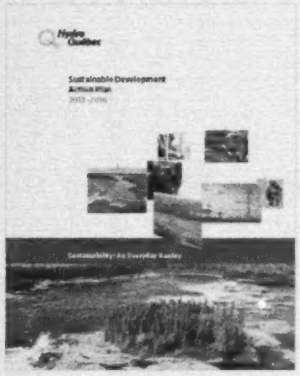
MANDATE

- Provide opinions and make recommendations to the Board concerning:
  - environmental management and compliance, and integration of sustainable development principles
  - public health and safety
  - community relations
  - social responsibility
  - contribution to the community
  - public image
- Receive environmental incident reports and related claims, opinions, investigations and legal proceedings.

2014 ACTIVITIES

- Studied the results of the President and CEO's annual environmental management review as well as semiannual reports on environmental compliance.
- Reviewed the *Sustainability Report 2013*, met with its auditors and reviewed their management report.
- Recommended that the Board approve the granting of donations and sponsorships according to the criteria and rules set out in the Donation and Sponsorship Policy.
- Reviewed annual results with respect to the company's communication and public relations activities, and the financing of university research chairs and international cooperation initiatives in French-speaking nations.
- Reviewed the annual activity reports of the Fondation Hydro-Québec pour l'environnement and of the liaison committees established by the company with groups representing Québec agricultural producers and municipalities.

Sustainable Development Action Plan 2013–2016



Since March 2013, Hydro-Québec has been working to fulfill its *Sustainable Development Action Plan 2013–2016*, which continues efforts laid out in its previous plan. By acting in accordance with sustainability principles, the company contributes to the implementation of Québec's Government Sustainable Development Strategy, its strategy to ensure the occupancy and vitality of territories (in French only) and its Agenda 21 for culture.

OVT Action related to the implementation of the strategy to ensure the occupancy and vitality of territories.

C Action related to the implementation of Québec's Agenda 21 for culture.

Power system electrician Pierre-Luc Turgeon, expert technician Marcel Picard and power system electrician Félix Gaudreau discuss the tasks required for special tests at Rapide-2 generating station.

ACTION 1 OVT BUILD HYDROPOWER PROJECTS

INDICATOR Cumulative capacity made available by the Romaine project

Result 2014
640 MW

Target 2014	Target 2015	Target 2016
640 MW	775 MW	910 MW

In Minganie (Côte-Nord), both units at Romaine-2 generating station (640 MW) were commissioned in the fall and their output was brought onto Hydro-Québec's grid. At the end of the year, we completed the dam and retaining structures for the Romaine-1 development and began assembling the generating units, with commissioning of the first unit slated for late 2015. At the Romaine-3 jobsite, construction proceeded at a steady pace. We completed the temporary diversion of the river and erected the first structures. (Additional information on pages 37 to 39)

ACTION 2 OVT INCREASE OUTPUT AND CAPACITY GAINS AT EXISTING HYDROELECTRIC GENERATING STATIONS

INDICATOR Average annual cumulative output gains

Result 2014
86 GWh/year

Target 2014	Target 2015	Target 2016
83 GWh/year	142 GWh/year	170 GWh/year

INDICATOR Cumulative gains in available peak capacity

Result 2014
42.2 MW

Target 2014	Target 2015	Target 2016
36 MW	42 MW	48 MW

In the Baie-James region (Nord-du-Québec), refurbishment of the first unit at Robert-Bourassa underground generating station was completed. The average annual output gain will total 51 GWh. This project to refurbish the most powerful facility in our generating fleet will continue over several years. Its goal is to increase unit efficiency by replacing the speed governors, excitation and control systems, and some turbine runners.

In Abitibi-Témiscamingue, we refitted the second of four units at both Rapide-2 and Rapide-7 generating stations. Replacing turbine runners yielded peak capacity gains of 3 MW at each generating station and total average annual output gains of 8 GWh.

In the Montérégie region, we completed the overhaul of a unit at Beauharnois generating station. The large rehabilitation project under way—which will involve overhauling five other units—will increase the output and extend the service life of this generating station, whose 36 units make it one of the most powerful facilities in our fleet. The average annual output gain will reach 24 GWh.

In Manicouagan (Côte-Nord), a second unit at Jean-Lesage generating station was refurbished. This plant overhaul will extend service life and increase capacity by about 30 MW.

In Mauricie, we made modifications to three units at Chute-Allard generating station and four units at Rapides-des-Cœurs, yielding 6.2 MW in additional capacity.

In Outaouais, we achieved an average annual output gain of 3 GWh thanks to the work performed in 2013 to optimize the operation of Paugan, Chelsea and Rapides-Farmer generating stations on the Gatineau.

ACTION 3 CONTINUE ENERGY EFFICIENCY INITIATIVES

INDICATOR **Energy savings since 2003**

Result 2014
8.2 TWh ✓

Target 2014 and 2015
8.0 TWh

The 8-TWh savings target for 2014 was set out in the Energy Efficiency Plan (EEP), introduced in 2003. Customer participation in EEP programs generated new savings of 504 GWh, bringing cumulative savings since the beginning to 8.2 TWh. ✓ Maintaining our programs and updating our action strategies enabled us to achieve sustainable efficiency gains and gradually implement new demand response measures. (Detailed results on pages 29 and 30)

ACTION 4 CONTINUE TO HELP LOW-INCOME CUSTOMERS

INDICATOR **Number of payment arrangements with low-income customers**[a]

Result 2014
99,722 ✓

Target 2014 to 2016
67,000/year

a) Including long-term arrangements.

In 2014, Hydro-Québec reached 99,722 special payment arrangements with low-income customers experiencing payment difficulties, for a gross total of $425 million. ✓

In response to the concerns expressed by the Québec government in Order-in-Council No. 841-2014, which directs the Régie de l'énergie [Québec's energy board] to take economic, social and environmental concerns into account when assessing rate changes for the 2015–2016 rate year, we filed a proposal to enhance our services for low-income households. The increase in the number of payment arrangements in 2014 is explained by the very cold temperatures over the winter of 2013–2014 and the company's desire to better support low-income customers. (Additional information on pages 54 and 55)

ACTION 5 CONTRIBUTE TO THE REDUCTION OF TRANSPORT-RELATED GHG EMISSIONS AND COLLABORATE IN THE ELECTRIFICATION OF TRANSPORTATION IN QUÉBEC

INDICATOR **Atmospheric emissions from the light-vehicle fleet**

Result 2014
24,016 t CO_2 eq. ✓

Target 2014 to 2016
27,700 t CO_2 eq./year

INDICATOR **Number of new charging stations and number of regions covered by the Electric Circuit**[a]

Result 2014
117 charging stations in 15 regions ✓

a) No target planned for 2014 to 2016.

GHG emissions from Hydro-Québec's vehicle fleet have decreased by 16.5% compared with 2005 (14.4% in 2013): 21.6% for light vehicles and 11.3% for heavy vehicles.

We are maintaining our efforts to reduce emissions from heavy vehicles. ✓

At the end of the year, the Electric Circuit included 350 charging stations (240 volts) in 92 cities (15 administrative regions in Québec) for a total of 236 service points. In addition to the 240-V stations, the Circuit also includes eight 400-V fast-charge stations: six in the Québec-Montréal corridor, one in Victoriaville and one in Boucherville. Since the Electric Circuit was inaugurated in March 2012, 87 partners have joined the 5 founding partners—Les Rôtisseries St-Hubert, RONA, METRO, the Agence métropolitaine de

transport (AMT) and Hydro-Québec. ✓ (Additional information about transportation electrification on page 59) Under the Allégo program, 421 trips ✓ (586 in 2013) were completed by means of the BIXI multi-user keys made available to employees in three of our buildings in downtown Montréal. In 2014, 111 employees ✓ (181 in 2013) took advantage of the free bicycle tune-ups offered to those who bike to work.

ACTION 6 CONTRIBUTE TO THE IMPLEMENTATION OF QUÉBEC'S POLICY FOR ECORESPONSIBLE GOVERNMENT

INDICATOR **Number of product purchasing guides that include ecoresponsible specifications**[a]

a) Cumulative results since the *Sustainable Development Action Plan 2013–2016* came into effect.

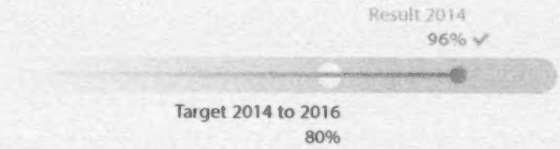
A second guide to ecoresponsible purchasing was produced in 2014, covering water and energy consumption by household appliances and related equipment. ENERGY STAR® certification will now be required for all residential-style electric appliances purchased for use by Hydro-Québec. The guide also includes criteria related to atmospheric emissions, packaging and end-of-life management of equipment. Since 2008, eight guides to ecoresponsible purchasing have been produced.

In 2014, Hydro-Québec continued its efforts in reduction at source, reuse and recycling. (Information on pages 25 and 26)

Increasingly, the holding of virtual classes and videoconferences helps reduce GHG emissions by minimizing participant travel, thereby contributing to the organization of ecoresponsible events. In 2014, the 14 ecoresponsible events held were seized as opportunities to educate some 850 employees on the potential environmental impacts of business meetings. ✓

ACTION 7 INFORM AND EDUCATE EMPLOYEES ABOUT SUSTAINABILITY AND THE COMPANY'S APPROACH

INDICATOR **Percentage of new hires having received the information on sustainability**



Throughout the years, a number of activities have been implemented to inform and educate employees about sustainability. The Sustainable Development Action Plan focuses on the education of new hires: 1,231 new employees were hired by Hydro-Québec in 2014. ✓

ACTION 8 PRESERVE AND ENHANCE BIODIVERSITY IN TRANSMISSION AND DISTRIBUTION LINE RIGHTS-OF-WAY

INDICATOR **Percentage of vegetation control operations per year that include** measures for enhancing biodiversity

Vegetation control in rights-of-way has a number of objectives: optimize operation of the grid and prevent outages, ensure the safety of equipment and of people who come close to it, and preserve the environment and its biodiversity. In 2014, biodiversity enhancement measures were integrated into the work done on 123,918 spans, ✓ representing 98% of the total spans in the distribution system that underwent vegetation control work.

Hydro-Québec uses various means to inform the public and municipalities affected by vegetation control operations on the distribution system: we send letters to municipalities notifying them of any pruning activities on their territory and making sure they understand the process and reasons for this activity; we contact an official at the municipalities affected; we send press releases to the municipalities and local media. Our goal is always to provide thorough information on this activity that is required for the safety and proper functioning of the grid.

The study of practices related to biodiversity and vegetation control in rights-of-way continued in 2014.

ACTION 9 PUBLICIZE THE KNOWLEDGE ACQUIRED THROUGH HYDRO-QUÉBEC ENVIRONMENTAL STUDIES

INDICATOR Number of documents published on the Web[a]

Result 2014
21 ✓

Target 2014	Target 2015	Target 2016
4	6	8

a) Cumulative results since the *Sustainable Development Action Plan 2013–2016* came into effect.

For many years, Hydro-Québec has been conducting environmental impact assessments in connection with its projects. The expertise acquired through these studies currently informs the design of new projects. In 2014, two new publications were added to the 19 existing documents: ✓

- Scientific article on the net evaporation from Eastmain 1 reservoir published in the magazine *Hydro Review*. The study shows that the ecosystems present before the reservoir was created were major sources of evaporation and evapotranspiration. Overall, the quantity of water that evaporates from the reservoir is similar to that of previous ecosystems, resulting in a net water loss through evaporation that is close to zero.
- Scientific article on the Forest-DNDC (DeNitrification-DeComposition) computer model, showing that the model can be used to evaluate carbon exchanges before and after reservoir creation. This study was published in connection with work to establish the carbon footprint associated with the creation of a reservoir over a 100-year period.

ACTION 10 ON C CONTINUE TO PROTECT AND ENHANCE THE COMPANY'S BUILT AND TECHNOLOGICAL HERITAGE

INDICATOR Number of good-practice guides produced and disseminated[a]

Result 2014
1 guide ✓

Target 2014	Target 2016
1	2

a) Cumulative results since the *Sustainable Development Action Plan 2013–2016* came into effect.

INDICATOR Number of annual visitors to facilities and jointly operated sites[b]

Result 2014
141,637 visitors in 11 regions ✓

b) No target planned for 2014 to 2016.

Hydro-Québec is the owner of a rich heritage made up of sites, buildings and equipment that bear witness to technological development and a century of industrial and institutional architecture. In 2014, we published a good-practice guide to standardize the processes for preserving, protecting and enhancing this heritage. The guide lays out the heritage context and the company's preservation principles, as well as precautions to be taken when carrying out generating station maintenance or refurbishment, among other points. A second guide on technological heritage related to the transmission system is being prepared.

In Manicouagan, tour guide Valérie Gagné welcomes visitors to Jean-Lesage generating station, commissioned in the mid-1960s.

Hydro-Québec's facilities and other sites, as well as its jointly operated sites, promote local tourism and educate the public about built and technological heritage. Our facilities and sites in 11 administrative regions in Québec welcomed 57,015 visitors in 2014, ✓ in addition to the 84,622 visitors to jointly operated sites.

CLIMATE CHANGE, BIODIVERSITY AND ENVIRONMENTAL MANAGEMENT

Transmission lines supported by waist-type towers, near Radisson substation (Baie-James).

There are many ways to generate electricity but all generating options have environmental impacts. To better understand the effects of each option, Hydro-Québec asked the Interuniversity Research Centre for the Life Cycle of Products, Processes and Services (CIRAIG) to conduct a study comparing the environmental impacts of the main power generation options and electricity mixes from various regions around the world. This study is based on life cycle assessment (LCA), which measures the environmental impact of a product or service over part or all of its life cycle.

- Power generation options: Based on the seven environmental indicators studied, the results for hydropower are excellent thanks to the option's minimal use of resources during the generation phase. Conversely, non-renewable thermal generation options show poorer results, due to the extraction, transformation and use of fuels.
- Electricity mixes: According to the study, electricity supplied in Québec has one of the best environmental performances. Even when compared to other regions with a heavy reliance on hydropower, such as Manitoba and Norway, Québec's electricity mix fared better.

In the area of Eastmain 1 reservoir, measuring instruments were placed on top of a tower to collect the different types of data that were used to evaluate net evaporation from the reservoir.

EXCLUSIVE WEB CONTENT

- Greenhouse gas emissions and reservoirs
- Life cycle assessment
- Effects of climate change on Hydro-Québec's activities
- Net reservoir evaporation
- Hydro-Québec's air emissions – Energy delivered to customers
- Declaration of ISO 14001 environmental principles
- Contaminated sites and spills
- Insulating oil
- Biodiversity activities – 2014 report **(in French only)**

2014 HIGHLIGHTS

- Net evaporation from Eastmain 1 reservoir in the Baie-James region is similar to that from preexisting ecosystems. In light of the growing interest by international environmental stakeholders regarding the water footprint of various generating options, we examined the case of Eastmain 1 reservoir. The study, conducted in collaboration with McGill University, showed that reservoir hydropower has very little effect on the hydrological cycle and does not reduce the availability of water in the region.

CLIMATE CHANGE

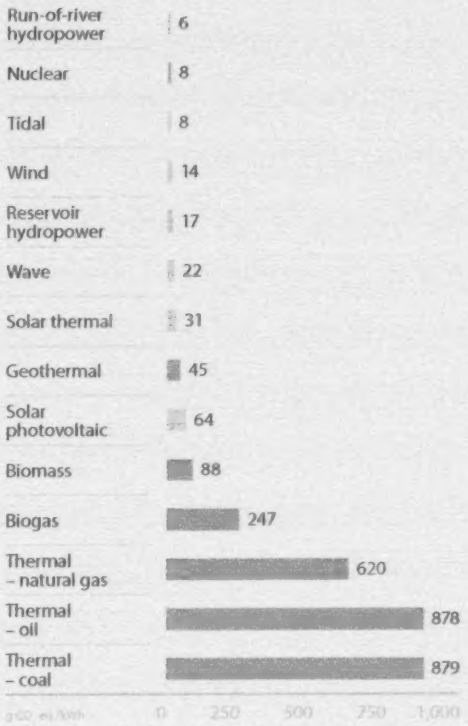
The latest conclusions of the Intergovernmental Panel on Climate Change (IPCC) confirm the reality of climate change and the extent of its effects: warming of surface water, acidification of oceans, melting of glaciers and pack ice, increase in the frequency of extreme weather events, etc.

If no further efforts are undertaken to reduce GHG emissions, the IPCC predicts that, by 2100, the mean temperature on the planet's surface will be 3.7°C to 4.8°C higher than the mean temperature during the period between 1850 and 1900. Since hydrocarbon consumption is a significant source of GHG emissions, the recent drops in oil prices are unlikely to help promote the adoption of additional energy saving measures.

In large part due to its size, climate and resource-based economy, Canada is among the countries with the highest GHG emissions per capita. Compared with other provinces and territories, Québec's per capita emission rate (10.1 t CO_2 eq.) is the third lowest in the country, after Nunavut's and Yukon's. In Canada, the electricity sector represents 12.1% of total emissions whereas in Québec, thanks to the abundance of water resources, it represents only 0.4%.

COMPARING CLIMATE CHANGE INDICATOR RESULTS

Power generation option



Note: Graphs adapted from the November 2014 study comparing power generation options and electricity mixes (*Comparaison des filières de production d'électricité et des bouquets d'énergie électrique*).

Data compiled from a literature review of over 60 reports or articles published since 2007 on LCAs of power generation. This data was compared with the data from a CIRAIG study on the impacts of the power generated, transmitted and distributed by Hydro-Québec in 2012.

Electricity mix by province and country

a) This value corresponds to the generation, purchase, import, transmission and distribution of electric power.

Data compiled from the **ecoinvent** database commonly used in LCA, presented by Canadian province or by country. The data was analyzed based on four indicators: climate change, human health, ecosystem quality and resource use.

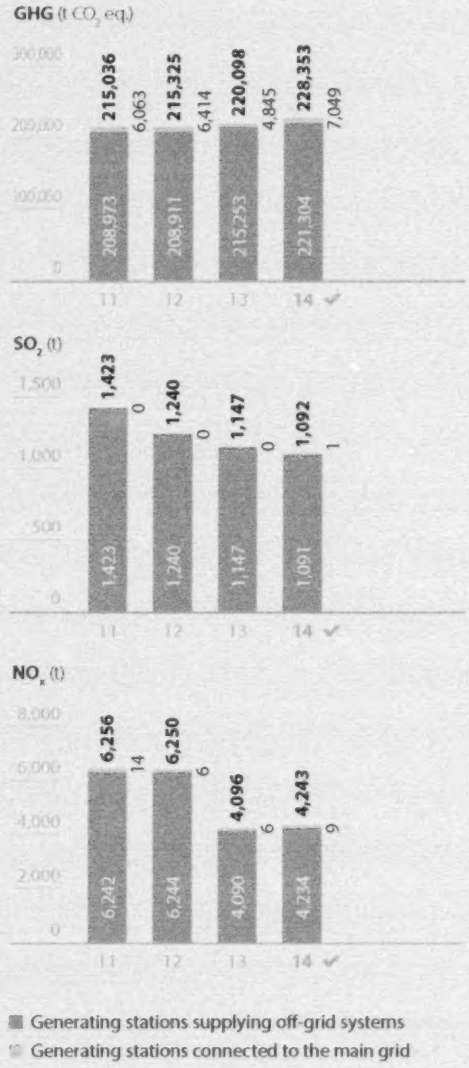
Thanks to its use of almost 99% renewable energy sources, ✔ Hydro-Québec has an excellent net GHG emission record. The emissions avoided (6,226,716 t CO_2 eq. ✔) through its net electricity exports largely outweigh the emissions generated by its operations (346,744 t CO_2 eq.). However, this positive differential will tend to wane as the U.S. Northeast increases its sources of supply with lower GHG emissions.

Under the Québec cap and trade system for GHG emissions allowances (C&T system), organizations, such as Hydro-Québec, that are subject to the system and emit 25,000 metric tons of CO_2 equivalent per year or more must offset their emissions, mainly by purchasing an equivalent number of emission units at the Québec government auction. Since January 1, 2014, Québec's carbon market has been officially linked to California's. Participants can buy emission units in California and use them to cover their GHG emissions in Québec.

GHG EMISSIONS FROM HYDRO-QUÉBEC OPERATIONS – 2014

CATEGORY	OPERATIONS	EMISSIONS (t CO_2 eq.) ✔
Direct sources (level 1)		
Generating stations	Thermal power plants	228,353
Mobile sources	Vehicle fleet	50,562
	Hydro-Québec aircraft fleet	13,796
	Utility vehicles (e.g., snowmobiles, tractors, snowblowers)	782
	Propane-fueled lift trucks	84
Fuel use	System maintenance generators	7,451
	Emergency and jobsite generators	2,513
	Building heating	703
Other uses	Equipment containing CF_4 and SF_6	18,948
	Aerosols	253
		323,445
Indirect sources (level 2)		
Energy losses	Power transmission and distribution system losses	23,299
Total direct and indirect emissions (levels 1 and 2)		**346,744**
Emissions avoided by net exports of electricity		**6,226,716**

ATMOSPHERIC EMISSIONS FROM HYDRO-QUÉBEC THERMAL GENERATION OPERATIONS



On January 1, 2015, fuel importers and distributors were included in the C&T system. This will likely affect the supply costs of vehicles and thermal generating stations with emissions below 25,000 metric tons of CO_2 equivalent.

The main sources of GHG emissions for which Hydro-Québec is subject to the C&T system are the following:

- Oil-fired thermal generating station on Îles de la Madeleine.
- Electricity purchases, from mainly thermal sources, outside Québec.
- Loss of insulating gases (SF_6 and CF_4) from certain transmission facilities.

2014 HIGHLIGHTS

- Hydro-Québec's net electricity exports helped avoid over 6.2 million tonnes of CO_2 emissions. ✔ That's the equivalent of the yearly emissions of close to 1,600,000 vehicles.
- Atmospheric emissions from power generation and purchases in Québec were significantly lower than the average for neighboring provinces and states in Canada and the U.S.: 1,579 t CO_2/TWh (152 times less), 4.2 t SO_2/TWh (88 times less) and 9.7 t NO_x/TWh (51 times less). ✔ Every year, Hydro-Québec produces a fact sheet titled Energy Supplies and Air Emissions, which can be used by industrial customers to perform carbon footprint calculations.

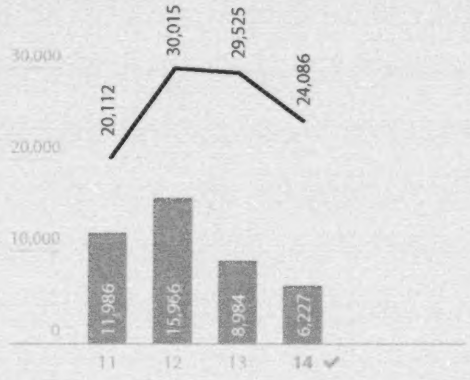
ADAPTATION TO CLIMATE CHANGE

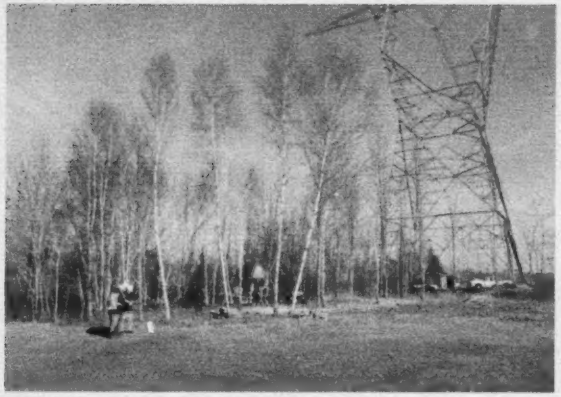
In view of the progression of climate change and the inadequacy of the measures taken by the world's countries to fight it, action must be taken to adapt to its effects. For Hydro-Québec, whose main resource—water—is weather dependent, a proper analysis of climate evolution is essential for adopting the right adaptation strategies.

According to the 2014 report by the Ouranos consortium (in French only), between 1950 and 2011, mean annual temperatures in Québec showed an upward trend of about 1°C to 3°C. Experts predict that this trend could escalate, with winters in northern Québec being 15°C warmer toward the end of the century. By 2050, average river flows are also expected to increase by about 12% in northern Québec and 5% in the south. The design of generating stations and reservoirs will most likely have to adapt to the changes in hydrological regimes through the implementation of various measures, both structural (addition of turbines or resizing of equipment) and non-structural (modification of management rules).

In terms of energy balance, Ouranos anticipates that increasing flows will go hand in hand with rising winter temperatures. This would lead to a decrease in the demand for heating, which will be partially offset by rising air-conditioning needs in summer. In addition, the frequency and intensity of certain extreme weather events could have significant consequences on power transmission and distribution facilities exposed to climate conditions.

EMISSIONS AVOIDED BY NET EXPORTS OF ELECTRICITY





Vegetation control operations in a transmission line right-of-way in Lévis, near the city of Québec. These operations are designed to preserve biodiversity.

PROTECTING BIODIVERSITY

The effects of climate change on the biological diversity of plants and animals is well documented. As temperatures increase, the habitat ranges of hundreds of species will move northward. Québec will become home to many new species, while some of the native ones will have trouble surviving. Biodiversity preservation strategies must therefore be implemented and refined.

About 60,000 species have been inventoried in Québec, representing 3% of the world's biodiversity. This low number is mainly attributable to our cold climate.

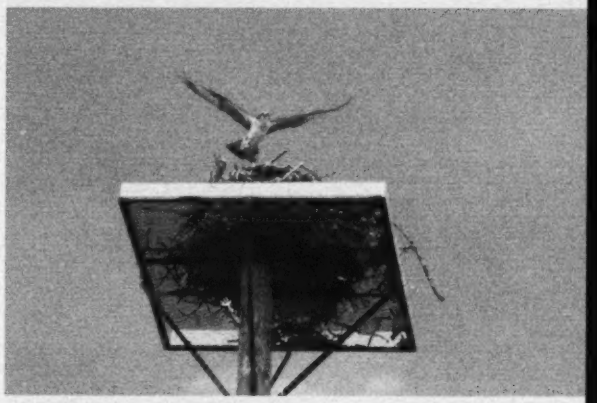
Hydro-Québec does everything possible to preserve biodiversity during its operating activities. We work in close cooperation with the Québec government to determine best practices for mitigating the impacts of our operations on wildlife and vegetation.

For example, as part of the Eastmain-1-A/Sarcelle/Rupert project, Hydro-Québec is conducting a follow-up on special-status plant species, which includes monitoring the population changes in two species likely to be designated as threatened or vulnerable, the golden hedge-hyssop (*Gratiola aurea*) and Robinson's hawkweed (*Hieracium robinsonii*).

Hydro-Québec also implements a number of measures to preserve biodiversity in its transmission line rights-of-way:

- Limit construction and other activities that significantly disturb the ground and thus the micro-habitats that are present on its surface, such as those associated with rocks, stumps and wood debris, which are needed by the dusky salamander and the blue-spotted salamander.
- In rights-of-way located in forests, maintain a habitat composed of shrubs and grasses in varying proportions, as this scattered-shrub type of habitat tends to attract many small mammals and birds.
- Carefully manage shrub screens and ponds used by frogs for breeding.
- Leave cut tree trunks on the ground to serve as habitat for insects, mushrooms and small mammals.
- Before carrying out vegetation control activities in rights-of-way, check to see if the targeted area includes sites listed as containing special-status species or habitats of interest. Additionally, avoid operations that eliminate all vegetation (use of nonselective herbicides, motorized brush cutters, etc.).

Hydro-Québec participates in the work of six at-risk species recovery teams ✓ coordinated by the Ministère des Forêts, de la Faune et des Parcs. In this way, we contribute to the protection of some 15 at-risk wildlife species in Québec, such as the western chorus frog and golden eagle. ✓



Osprey platform built by Hydro-Québec when dismantling part of a power line in Gaspésie.

LISTENING TO THE COMMUNITY

Hydro-Québec dismantled a line section between Matapédia and Nouvelle that contained seven osprey nests, including one that was clearly visible from Highway 132. This nest had become a local attraction and the community got involved to protect it. After reaching an agreement with the municipality of Escuminac, we transported the nest to a new platform, where it was quickly adopted by an osprey pair.

A golden-winged warbler, a protected species.

2014 HIGHLIGHTS

- As part of the Mauricie–Lanaudière line project, we compensated for the loss of forested area by planting over 7,000 trees: black walnut, butternut, shagbark hickory, bitternut hickory, black cherry, bur oak, red oak, white spruce and larch.
- The company is working with a group of birdwatchers to protect the golden-winged warbler, a forest bird that is likely to be designated vulnerable or threatened in Québec. We will be developing specific vegetation control practices for line rights-of-way in forests, which are used by this species.
- We continued to track the movements of 25 forest-dwelling woodland caribous in order to determine the real impact of construction of the Romaine complex on this species, designated vulnerable in Québec. Our caribou monitoring program also includes periodic aerial surveys and an evaluation of habitat quality.

ENVIRONMENTAL MANAGEMENT

Hydro-Québec carries out generation, transmission and distribution operations in very diverse environments, from the boreal forest to large urban centres. Managing the environmental impact of these operations is an integral part of the company's business processes.

Since the late 1990s, ISO 14001–certified environmental management systems have guided Hydro-Québec operations that could have an effect on the environment.

2014 HIGHLIGHTS

- One million litres of drinking water were saved through our 2014 initiatives under the program for refurbishing administrative buildings. ✔ Recurring savings since 2007 total 246 million litres, enough to fill 82 Olympic-size swimming pools.
- Six buildings earned BOMA BESt certification, which assesses the environmental performance and management of commercial buildings in Canada. ✔ All the buildings for which certification was renewed in 2014 achieved level 3 (out of 4). In total, 15 of Hydro-Québec's buildings are BOMA BESt certified.
- Clé Verte environmental certification (in French only) was renewed for four of the shared services centre's repair shops. The Gatineau, Lebourgneuf, Trois-Rivières and La Grande-4 shops earned gold-level certification, ✔ bringing the company's total to nine. Clé Verte (Green Wrench) certification, awarded by Nature-Action Québec, recognizes vehicle repair shops that meet criteria based on environmental best practices.
- We implemented a process for deleting hard drives: 577 server hard drives and 4,177 hard drives on desktop computers and laptops were erased for potential reuse. All others that cannot be reused will be recycled.

SPILL ON ÎLES DE LA MADELEINE

On Îles de la Madeleine, Hydro-Québec operates a 67.2-MW thermal generating station to supply the islands' nearly 13,000 residents, who have always relied on fuel oil to meet their energy needs. Accordingly, a pipeline connects the dock at Cap-aux-Meules, where the boats unload their cargo, to the storage tanks located near the generating station.

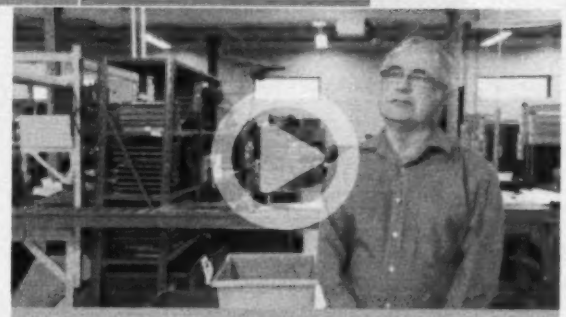
On September 11, 2014, a spill occurred at Cap-aux-Meules port. At that time, Hydro-Québec was conducting tightness tests on the pipeline. As soon as the link between the tests and the spill was established, the company immediately contacted the authorities concerned. We implemented emergency measures to stop the leak, contain the spill and recover the fuel. Booms were installed to prevent the oil from spreading in the water and, once we had received the required authorizations from the Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques, we set up an oil treatment and recovery system. The estimated quantity of diesel fuel spilled is about 100,000 litres. Hydro-Québec is continuing work to rehabilitate the site and is in constant communication with federal and provincial authorities, the municipality and affected local associations.

- Over 2,500 employees (1,666 in 2013) signed up for the print release service, which optimizes our printer pool, saves paper and supplies, and increases confidentiality. In 2014, this service allowed us to reduce paper use by 9.4%.
- Investigations, rehabilitation and follow-up were performed at various contaminated sites belonging to Hydro-Québec: treated-pole storage yards, fueling stations, generating stations and substations.
- Spills reported to authorities: 897 (999 in 2013). ✓ The decrease is mainly attributable to a reduction of spills on construction sites.

PROCUREMENT, RECOVERY, REUSE AND RECYCLING OF RESIDUAL MATERIALS – SOME STATISTICS

	2014		
	PROCUREMENT	**RECOVERY**	**NOTES**
Printer cartridges and accessories (units)	15,854 ✓	19,280 ✓	Purchased recycled cartridges accounted for 50% (30% in 2013).
Computer equipment			Computer and electronic equipment is collected by a company that employs people with functional limitations. After the data is erased, equipment that still has value is sold or given to charities. Obsolete or damaged equipment is dismantled and recycled.
▪ Purchased (units)[a]	13,062	not applicable	
▪ Computers (units)	not applicable	5,664 ✓	
Wooden pallets (units)	not available	14,680 ✓	About 85% of the recovered pallets are given to a company that reconditions and reuses them. Pallets in poor condition are recycled.
Paper and paperboard (tonnes)	270 ✓	1,280 ✓	Purchases were for paper only. They decreased 6% compared to 2013.
Porcelain from transmission line insulators (tonnes)	not available	78 ✓	All insulators are crushed. Metals are removed and recycled; porcelain is mainly used as landfill mulch.
Clothing (kilograms)	not available	8,018 ✓	Collection is handled by CFERs in Alma and Boucherville. Clothing that is still usable is reconditioned and sold. Worn-out clothing is recycled when possible.

a) Computer equipment includes desktop, laptop and workstation computers and monitors.



Claude Cyr, Advisor – Business Practices, Hydro-Québec

SUSTAINABLE MANAGEMENT OF EXCESS COMPUTER MATERIAL

Hydro-Québec owns nearly 25,000 IT devices. As part of its Sustainable Development Action Plan, the company has committed to reusing and recycling its residual materials, including IT equipment that has reached the end of its useful life. Once the data on excess IT equipment is deleted, the equipment is sent over to AFFI for recycling and reuse. Every year, around 5,500 desktop computers and laptops are passed on to this social economy organization that employs 450 people, 83% of whom have reduced mobility.

DEMAND-SIDE MANAGEMENT

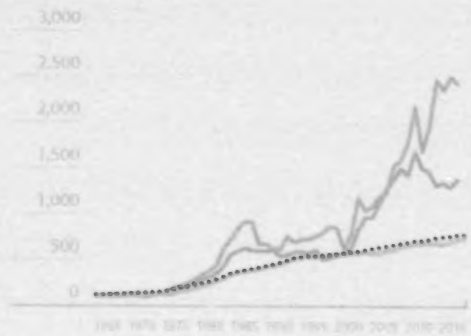
Montréal's suburbs are growing denser. We offer the public a number of energy efficiency programs to help reduce electricity consumption.

Quebecers are among the world's largest consumers of electricity. This is explained by two main factors. First, a large amount of energy is consumed during the harsh Québec winters, especially for heating. Second, owing to the development of abundant hydropower resources in the late 1970s, most Quebecers turned to electric heating to heat their homes and water. Through this choice, they greatly reduced their dependence on oil products, adopting a minimally polluting energy source. This partly explains Québec's exemplary performance in terms of GHG emissions.

Published in November 2014, the International Energy Agency's report projects 37% growth in global energy demand by 2040, mainly due to rising consumption in Asia. The report also underlines that about 65% of economically profitable energy saving measures are not being implemented on an international scale.

Since then, the fall in oil prices has modified short-term global outlooks. Even though they are not directly influenced by the volatility of oil prices, Québec's electricity rates remain much lower than those charged anywhere else in North America.

INFLATION AND TRENDS IN ENERGY PRICES IN QUÉBEC 1963–2015



2015 data for oil and gas not available.

Sources: Hydro-Québec, Régie de l'énergie, Bloomberg's *Oil Buyer's Guide* and Statistics Canada.

EXCLUSIVE WEB CONTENT

- Comparison of electricity prices
- Self-generation
- Energy efficiency – Residential customers

A variety of means are used to encourage residential customers to save water and electricity.

RATES

Hydro-Québec guarantees the same electricity rates throughout Québec, based on the consumption profile of different customer groups. Beyond the basic rate, options are available to meet special needs. Rates have three main components that account for the different costs of providing electricity service: the fixed charge, the price of energy and the price of power demand. All rate change applications must be approved by Québec's Régie de l'énergie according to a well-defined process.

Self-generation net metering option

The net metering rate option is designed for customers willing to acquire the equipment needed to generate electricity from a renewable energy source. The option allows them to feed their surplus power into the Hydro-Québec grid in exchange for credits in kilowatthours applied to their electricity bill. Conversely, if they do not generate enough power for their needs, they can draw electricity from the grid. In 2014, 69 customer accounts (512 kW of solar and wind power) were using the net metering option.

BUSINESS AND RESIDENTIAL CUSTOMER RATES

BUSINESS CUSTOMERS **Main rates**

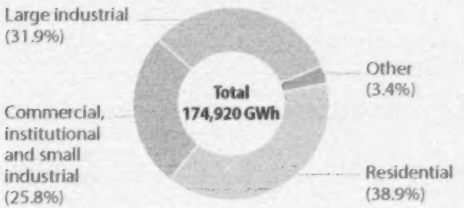
- Rate G: for small-power customers, such as convenience stores or hairdressing salons (power demand: < 65 kW).
- Rate M: for medium-power customers, such as SMEs, small industrial companies and shopping centres (power demand: > 50 kW).
- Rate LG: for large-power customers not engaged in an industrial activity. Examples include hospitals, universities and office buildings (power demand: > 5,000 kW).
- Rate L: for large-power customers engaged in an industrial activity (power demand: > 5,000 kW).
- Public Lighting: for governments and municipalities.

Other rates and options are available to meet specific needs.

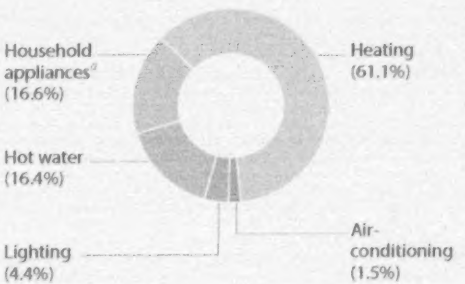
RESIDENTIAL CUSTOMERS **Main rates**

- Rate D: for most residential and agricultural customers.
- Rate DM: for multiunit residential buildings.
- Rate DT: for residential and agricultural customers with a dual-energy system.

ELECTRICITY SALES IN QUÉBEC BY SEGMENT – 2014



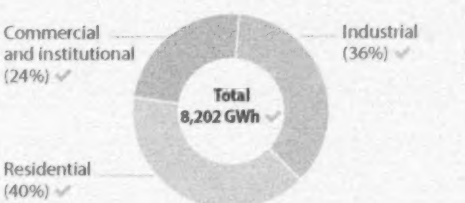
BREAKDOWN OF ENERGY CONSUMPTION BY TYPE OF USE – RESIDENTIAL SEGMENT – 2011



a) Includes refrigerators, freezers, washers, dryers, stoves, etc.

Sources: Ministère de l'Énergie et des Ressources naturelles du Québec and Natural Resources Canada.

CUMULATIVE ENERGY SAVINGS SINCE 2003 BY SEGMENT (EEP) – 2014



ENERGY EFFICIENCY PLAN (EEP)

Under the EEP, Hydro-Québec carries out energy efficiency programs, modernizes its intervention strategies and gradually sets up new demand response measures. The EEP also includes programs tailored to low-income customers. The EEP energy savings target of 8 TWh for 2013–2015 was met a year earlier than expected. In 2014, customer participation in EEP programs generated savings of 504 GWh, for a cumulative total of 8.2 TWh since 2003. ✓

2014 HIGHLIGHTS

- Hydro-Québec received two ENERGY STAR® awards: Utility of the Year – Provincial, and Promotional Campaign of the Year, for the campaign on LED service life. These are the 14th and 15th awards earned by Hydro-Québec as part of Natural Resources Canada's program for energy efficiency promotion. ✓

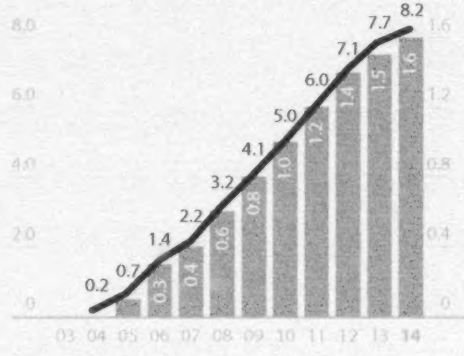
Residential customers

- To speed up implementation of demand response measures, we launched a pilot project for interruptible water heaters. The project was tested in winter 2014–2015 with a view to rolling out a wider-scale program in winter 2015–2016.
- Great success was achieved with the Lighting Program, which promotes the purchase and installation of ENERGY STAR® certified LED bulbs. Energy savings totaled 90 GWh. ✓
- In its second year, the Efficient Pools Program generated savings of 26 GWh ✓. This program promotes the use of three products to reduce electricity consumption: a timer, a solar pool cover and a two-speed or variable-speed pump.
- We launched the ENERGY STAR® Certified Windows and Patio Doors Program for rental properties. The program offers financial assistance for the purchase of double-glazed or triple-glazed windows and patio doors.
- We also launched the Efficient Homes Program (in French only) designed for builders of single-family homes. The program encourages the inclusion of various energy-saving measures in new homes, such as LED lighting, certified windows and doors, electronic thermostats, three-element water heaters, charging stations for electric vehicles, grey-water heat recovery systems and geothermal systems. Close to 40 homebuilders are taking part in this program. ✓

COMPARATIVE INDEX OF ELECTRICITY PRICES AT APRIL 1, 2014 – RESIDENTIAL CUSTOMERS[a]

a) Monthly bill (before taxes) for consumption of 1,000 kWh.

EEP PROGRESS – 2003–2014 PERIOD



RESULTS OF ENERGY EFFICIENCY INITIATIVES – EEP (GWh)

	OBJECTIVES				RESULTS[a]			
	2011	2012	2013	2014	2011	2012	2013	2014 ✓
Residential market	279	262	159	181	351	270	215	227
Business market	369	431	394	284	656	770	398	277
Energy savings[b]	**648**	**693**	**553**	**464**	**1,007**	**1,040**	**613**	**504**

a) May have been adjusted following program evaluation.

b) Overall total and sum of subtotals may differ due to rounding.

Commercial, institutional, industrial and agricultural customers

- We recognized 28 companies for excellence in energy efficiency. ✔ As members of our Energy Savers' Circle, these organizations have demonstrated their commitment to sustainability through concrete actions.
- We continued our Efficient Farming Products Program, for a total of 68 GWh in energy savings since 2003. ✔
- For business customers, we continued to offer our integrated energy efficiency service under the Buildings Program and the Industrial Systems Program. Savings achieved reached 268 GWh, for a cumulative total of nearly 2 TWh since the launch of the programs in 2011. ✔

ENERGY EFFICIENCY OF HYDRO-QUÉBEC FACILITIES

Hydro-Québec takes measures to limit system losses and improve the energy performance of its equipment and facilities. For example, in 2014, we installed a geothermal system at the Lebourgneuf administration centre (city of Québec), and modernized the geothermal system at the Laval administration centre. These two projects should generate 1.2 GWh in energy savings.

2014 HIGHLIGHTS

- The CATVAR project yielded total savings of 251 GWh. By 2023, we will have installed 1,000 remotely monitored voltage transformers in about 130 satellite substations, providing annual savings of 2 TWh.

New members of Hydro-Québec's Energy Savers' Circle, which recognizes companies that have demonstrated their commitment to sustainability through concrete actions.

The Efficient Farming Products Program is designed to help farms, such as this one in Témiscamingue, save energy.

ENERGY EFFICIENCY RESULTS – ADMINISTRATIVE BUILDINGS (kWh/m²)

	OBJECTIVES[a]		RESULTS			
	2013	2020	2011	2012	2013	2014
Average energy consumption	246	216	263	255	245	not available[b]

a) The energy consumption objectives are based on market indicators (BOMA BESt). From 2010 to 2014, we monitored 85 buildings.

b) Data not available at the time of publication.

ENERGY PORTFOLIO

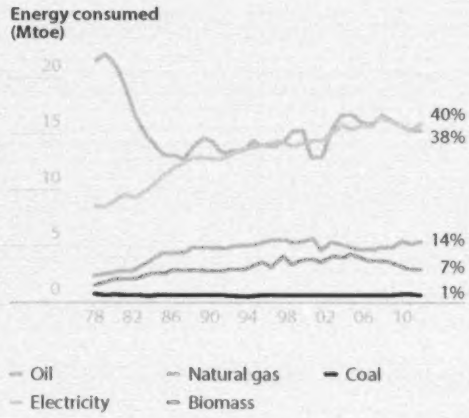
Beauharnois generating station, in the Montérégie region, is one of the world's largest run-of-river plants.

As underscored by the Ministère de l'Énergie et des Ressources naturelles du Québec (in French only), about 40% of the final energy consumed in Québec comes from electricity generated from renewable sources, a unique situation. In the rest of the world, energy portfolios are generally dominated by fossil fuels—particularly oil but also coal—while renewables often account for less than 15% of the total energy consumed. In Québec, following sustained growth that ended in the mid-1980s, electricity consumption has been progressing at a more moderate pace. In addition to its sales on the domestic market, Hydro-Québec also exports electricity outside Québec. Though subject to the vagaries of supply and demand in North America, these exports contribute to the company's profitability.

CAPACITY AND ENERGY NEEDS IN QUÉBEC

In the progress report (in French only) on its latest Electricity Supply Plan, Hydro-Québec Distribution anticipates an average increase in energy needs of 2.5 TWh per year for 2015–2023 compared to its previous projections. This growth is mainly attributable to higher demand in the aluminum sector, and would result in surpluses being reduced by 300 GWh to 3.5 TWh, depending on the year. Surpluses are estimated at about 56 TWh from 2014 to 2023. With a view to using energy surpluses to stimulate economic development, the Québec government has suggested implementing a competitive electricity rate for companies, to attract industrial investment

TRENDS IN THE CONSUMPTION OF DIFFERENT FORMS OF ENERGY IN QUÉBEC (1978–2011)



Sources: Ministère de l'Énergie et des Ressources naturelles du Québec and Statistics Canada.

EXCLUSIVE WEB CONTENT

- Characteristics of Hydro-Québec's electricity
- Hydro-Québec's generating facilities
- Electricity purchases – Québec market
- Hydro-Québec's research institute, IREQ
- Renewable energy sources: current state of knowledge
- Self-generation

and strengthen the competitiveness of the manufacturing sector in Québec.

2014 HIGHLIGHTS

- Electricity sales in Québec: 174.9 TWh (173.3 TWh in 2013).
- Peak power demand on January 8, 2015: 38,743 MW (39,031 MW on January 22, 2014).

ELECTRICITY SUPPLY

To provide Quebecers with a reliable supply of electricity, Hydro-Québec has a generating fleet producing primarily renewable energy and can count on 66 long-term supply contracts covering 15 to 25 years. Most of these contracts are based on government decrees regarding the purchase of blocks of renewable energy and are approved by the Régie de l'énergie.

To handle very short-term electricity needs, one-time purchases of electricity and bilateral agreements have been included in the Electricity Supply Plan. For short-term power needs, the company also relies on commercial measures taken with our customers. For example, we may ask industrial customers to reduce their power demand during peak periods in return for compensation for their decreased production.

HYDROPOWER

The third leading source of electricity generation in the world, hydropower guarantees a reliable supply. Thanks to its storage capacity, a reservoir generating station can react instantly to changes in demand and adjust almost in real time to peak demand. In comparison, it can take up to 12 hours to start up a conventional thermal power plant.

ENERGY BALANCE (TWH)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Needs covered by the Electricity Supply Plan	**188.8**	**186.2**	**188.8**	**189.5**	**190.4**	**191.7**	**194.4**	**195.8**	**197.4**	**198.8**
Heritage pool	178.9	178.9	178.9	178.9	178.9	178.9	178.9	178.9	178.9	178.9
Baseload and cycling electricity	4.3	3.3	3.5	3.5	3.6	4.1	4.6	4.6	4.7	4.2
Biomass and small hydro	1.5	2.0	2.8	3.3	3.5	3.5	3.5	3.5	3.5	3.5
Wind	6.8	8.3	9.7	10.5	11.5	11.5	11.5	12.1	12.1	12.1
Energy purchases in winter	2.6	0.3	0.4	0.5	0.4	0.5	0.9	1.5	2.1	3.2
Total supplies	**194.1**	**192.8**	**195.3**	**196.7**	**197.9**	**198.5**	**199.4**	**200.6**	**201.3**	**201.9**
Surplus[a]	**5.3**	**6.6**	**6.4**	**7.2**	**7.5**	**6.8**	**5.0**	**4.7**	**3.8**	**3.0**

a): Needs covered and supply totals may differ due to rounding.

Hydro-Québec will continue to rely on the flexibility of the heritage pool to ensure a balance between energy supply and demand, since the other long-term commitments at its disposal are firm and their electricity deliveries cannot be reduced.

CAPACITY AND ENERGY

Electric power or **capacity** is measured in watts (W) and corresponds to the ability to instantly respond to a request. A restaurant's capacity, for example, is determined by its number of tables.

Energy, on the other hand, corresponds to the work performed or capable of being performed in a given timeframe. It is measured in watthours (Wh). In the restaurant example, the energy would be the number of meals that can be served in an hour, a week or a year.

During **peak** periods, even if there is enough food, the restaurant might run out of tables, and people would have to wait in line. For the power grid, waiting is not an option: it must be able to meet capacity demands at all times. If the consumption peak is too high, either demand must be reduced (which is possible thanks to interruptible electricity options) or additional capacity must be purchased from neighboring grids.

In cases like Hydro-Québec's, where electricity is generated almost entirely from water, the **energy reserve** is based on reservoirs whose storage can be managed on a multiyear basis.

With water used to generate over 99% of Hydro-Québec's output, ✓ the company is the largest hydropower producer in North America and one of the main producers in the world. Of the 4,500 or so rivers in Québec, the company has harnessed 75, on which it operates 27 large reservoirs, 668 dams and 98 control structures to produce electricity.

2014 HIGHLIGHTS

- Romaine-2 generating station was commissioned and work continued on the Romaine-1, Romaine-3 and Romaine-4 jobsites. For more information, see pages 37 to 39.
- We refitted the generating units of several plants, achieving capacity gains of 42.2 MW. For more information, see page 16.
- We celebrated the 100th anniversary of Les Cèdres generating station around the themes of Hydro-Québec's industrial heritage, the environment and the region's history. More than 1,000 visitors took part in this event, held on June 14, 2014.

WIND POWER

According to the Canadian Wind Energy Association, 2014 was a record year for wind power growth in Canada thanks to the completion of 37 projects, which brought the country's installed capacity to 9,700 MW. In Québec, the use of wind power is facilitated by the presence of hydropower generating stations that can start up instantly, compensating for the intermittence of wind. In 2014, Québec ranked second in the country, behind Ontario, in terms of installed wind power capacity.

The wind generation contracted following the 2003 tender call (1,000 MW) has been brought onto the Hydro-Québec grid, and we are gradually integrating the wind generation from the 2005 (2,000 MW) and 2009 (500 MW) tender calls. An additional tender call for 450 MW of wind power was launched in 2013, subsequent to a Québec government regulation. In December 2014, the company purchased the output of 31 wind farms for a capacity of 2,857 MW.

2014 HIGHLIGHTS

- The following wind farms were commissioned, for a total capacity of 457.5 MW: Vents-du-Kempt, Rivière-du-Moulin phase 1, Seigneurie-de-Beaupré-4, Des Moulins-2 (2005 tender call), Saint-Damase, La Mitis, Le Plateau-2, Témiscouata and Du Granit (2009 tender call). ✓
- We announced the selection of three projects totaling 446.4 MW (2013 tender call): Nicolas-Riou (224.4 MW), Roncevaux (74.8 MW) and Mont-Sainte-Marguerite (147.2 MW). ✓
- A contract for a block of wind power was signed with the Mi'gmawei Mawiomi Aboriginal group representing three Mi'gmaq communities in Gaspésie. This mutual agreement was reached in accordance with the government decree (in French only) exempting Hydro-Québec from issuing a tender call in order to enter into an agreement with a supplier linked to an Aboriginal community (149.3 MW). ✓

Richard Mailhot, Manager – Power System Expertise and Scheduling, Centre de conduite du réseau, Hydro-Québec

PEAK DEMAND

Electricity demand is cyclical and peaks when there is a sudden increase in the energy consumed by all our customers. Demand is higher in the mornings and late afternoons when people return home from work and prepare dinner. Since most homes in Québec use electric heating, we face our biggest challenge in the coldest weather: winter peak, the time of year when demand is at its highest.

BIOMASS

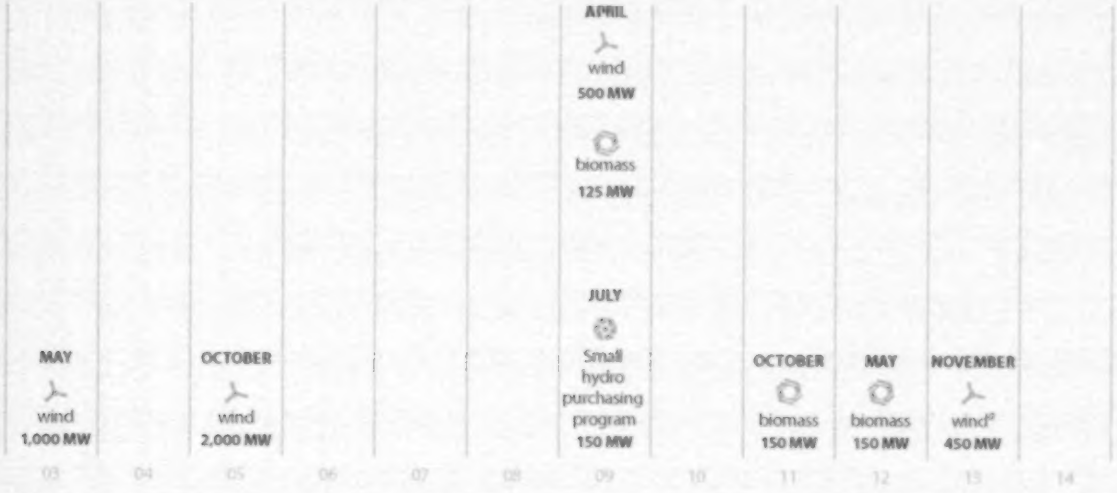
Biomass is organic matter, derived from plants or animals, that can be burned to produce heat or generate electricity. The International Energy Agency projects that it will be the fastest-growing renewable energy source between now and 2030, providing as much as 30% of the power consumed worldwide by 2050. In Canada, about 4.4% of the primary energy consumed comes from biomass. It is the second-biggest source of renewable energy, after hydropower.

In Québec, forest biomass is the most frequently used organic matter due to its ready availability and the maturity of the generating method involved. Biomass potential in Québec is based on three major categories of source matter: forest biomass, agrifood biomass and urban biomass.

2014 HIGHLIGHTS

- Three contracts (19.9 MW) were signed under the program to purchase electricity produced by forest biomass cogeneration in Québec (300 MW). ✓
- We commissioned Brompton-2 generating station (3.8 MW), a biomass cogeneration plant in Estrie. ✓

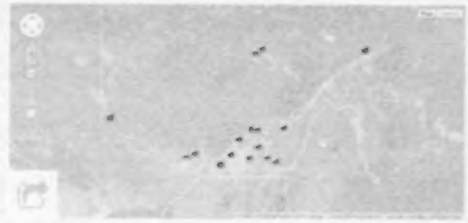
GOVERNMENT DECREES REGARDING RENEWABLE ENERGY PURCHASES



a) In addition to this 450-MW block, a 150-MW block is planned for a Mi'gmawei Mawiomi group project and a 200-MW block will be supplied by Hydro-Québec Production.

WIND FARMS AND GENERATING STATIONS (COGENERATION AND SMALL HYDRO) COVERED BY SUPPLY CONTRACTS

Wind farms



Cogeneration plants

Small hydropower stations

OTHER RENEWABLES

For some years now, Hydro-Québec has been conducting research on new renewable sources of electricity generation.

2014 HIGHLIGHTS

- We posted data sheets online covering the current state of knowledge on the following energy sources: biomass, hydrokinetic, osmotic and photovoltaic solar. The sheets discuss the energy source's current status, potential in Canada and Québec, output and costs, main advantages and disadvantages, and sustainability.

THERMAL AND NUCLEAR POWER

Hydro-Québec's thermal facilities are mainly connected to off-grid systems supplying isolated communities. Nunavik, Haute-Mauricie, the Basse-Côte-Nord region, Île d'Anticosti and Îles de la Madeleine are home to a total of some 35,000 inhabitants in 30 communities that include Atikamekw, Cree, Innu, Inuit and Naskapi populations. These communities are supplied by diesel-fired thermal generating stations, one oil-fired thermal plant (Cap-aux-Meules) and one hydropower plant (Lac-Robertson), which are not connected to the main grid due to their remote locations.

Gentilly-2 nuclear generating station ceased operations on December 28, 2012. The main steps of its decommissioning are now complete, and the facility was rendered dormant in January 2015. Hydro-Québec is finalizing the facility's transition into the first phase of a safe state of storage. To achieve the second phase in 2021, we will transfer the irradiated fuel from the pool to the dry storage area, where two new modules will be built. In addition, we will permanently retire the systems that are no longer required and carry out preparatory work to obtain a new permit by 2016.

NET ELECTRICITY GENERATED AND PURCHASED BY HYDRO-QUÉBEC (GWh)

	2011	2012	2013	2014 ✓
Hydropower generated	165,478	167,254	177,858	172,677
Hydropower purchased[a]	33,586	38,300	34,668	33,388
Biomass and waste reclamation power purchased	1,217	1,233	1,614	1,724
Wind power purchased	1,531	2,562	4,721	6,650
Total renewables[b]	**201,813**	**209,349**	**218,861**	**214,439**
Total energy generated	169,017	171,442	178,150	172,981
Total energy purchased	39,724	42,600	41,996	43,723
Total energy generated and purchased[c]	**208,742**	**214,062**	**220,147**	**216,703**
Total renewables/Total energy generated and purchased (%)	**97**	**98**	**99**	**99**

a) Includes purchases from Churchill Falls (Labrador) Corporation Limited and independent power producers, including McCormick generating station, in which Hydro-Québec holds a 60% interest.

b) These figures include renewable energy certificates for the output of Hydro-Québec Production's generating stations (142 GWh in 2014, 142 GWh in 2013 and 24 GWh in 2012) that were sold to third parties. They do not include wind energy, hydropower and biogas purchases for which renewable energy certificates were sold to third parties.

c) Overall total and sum of subtotals may differ due to rounding.

HYDRO-QUÉBEC GENERATING FACILITIES – 2014

FACILITIES[a]	NUMBER ✓	MW ✓	NET OUTPUT (GWh)[b] ✓
Hydroelectric generating stations	62	36,100	172,677
Thermal power plants	25	543	304
Total	**87**	**36,643**	**172,981**

a) One hydroelectric generating station and 24 of the 25 thermal power plants serve off-grid systems.

b) These figures include renewable energy certificates for the output of Hydro-Québec Production's generating stations (142 GWh) that were sold to third parties.

Note: In addition, Hydro-Québec has access to almost all the output from Churchill Falls generating station (5,428 MW) under a contract with Churchill Falls (Labrador) Corporation Limited that will remain in effect until 2041. It also purchases all the output from 31 wind farms (2,857 MW) and almost all the output from 10 biomass and biogas cogeneration plants (206 MW) and 4 small hydropower plants (48 MW) operated by independent power producers. Moreover, 1,132 MW are available under long-term contracts with other suppliers.

2014 HIGHLIGHTS

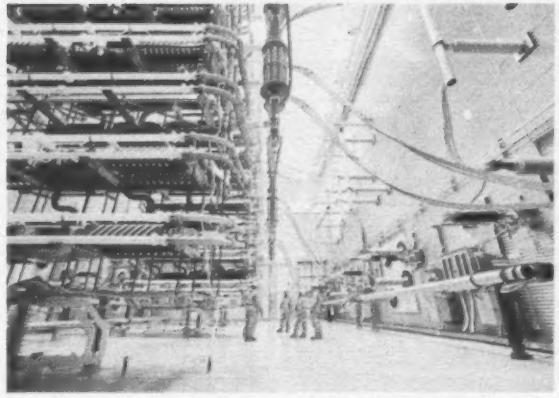
- In an effort to reduce the environmental impacts and supply costs associated with off-grid systems, we continued to study the cost-effectiveness of wind-diesel hybrid technology.
- The Régie de l'énergie approved the suspension of deliveries from the thermal generating station in Bécancour (TransCanada Energy) for 2014 to 2018. (Centre-du-Québec)

EXPORT MARKETS

Hydro-Québec is continuing talks regarding participation in projects to build transmission lines between Québec and certain states in the U.S. Northeast, with a view to increasing exports to those markets. Export revenues rose in 2014 due to higher prices in neighboring markets early in the year, when intense cold gripped North America.

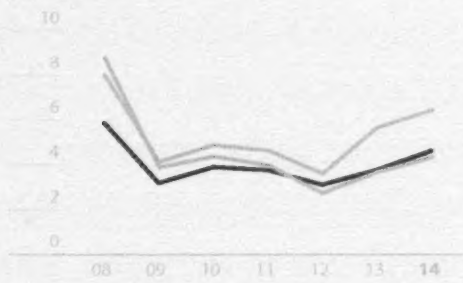
2014 HIGHLIGHTS

- Electricity sales outside Québec: 26.6 TWh (32.2 TWh in 2013).
- Revenue from sales outside Québec: $1,629 million ($1,525 million in 2013).
- Net electricity exports: $1,529 million ($1,353 million in 2013).



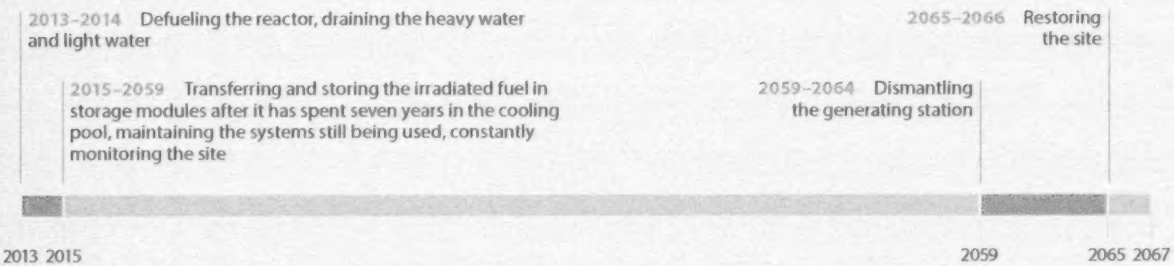
Converter room at Outaouais substation, which allows interchanges with Ontario.

TRENDS IN ENERGY PRICES ON HYDRO-QUÉBEC'S EXTERNAL MARKETS



- Natural gas: Henry Hub (US$/MMBtu)
- Electricity: New England – ISO-NE, Mass Hub, Day-Ahead Market (US¢/kWh)
- Electricity: New York – NYISO, Zone A, Day-Ahead Market (US¢/kWh)

DISMANTLING OF GENTILLY-2 NUCLEAR GENERATING STATION


2013–2014 Defueling the reactor, draining the heavy water and light water
2015–2059 Transferring and storing the irradiated fuel in storage modules after it has spent seven years in the cooling pool, maintaining the systems still being used, constantly monitoring the site
2059–2064 Dismantling the generating station
2065–2066 Restoring the site
2013 2015
2059
2065 2067

Romaine project

STATUS
Under construction

COST
$6.5 billion

REGION
Côte-Nord

CONSTRUCTION
2009–2020

INSTALLED CAPACITY
1,550 MW

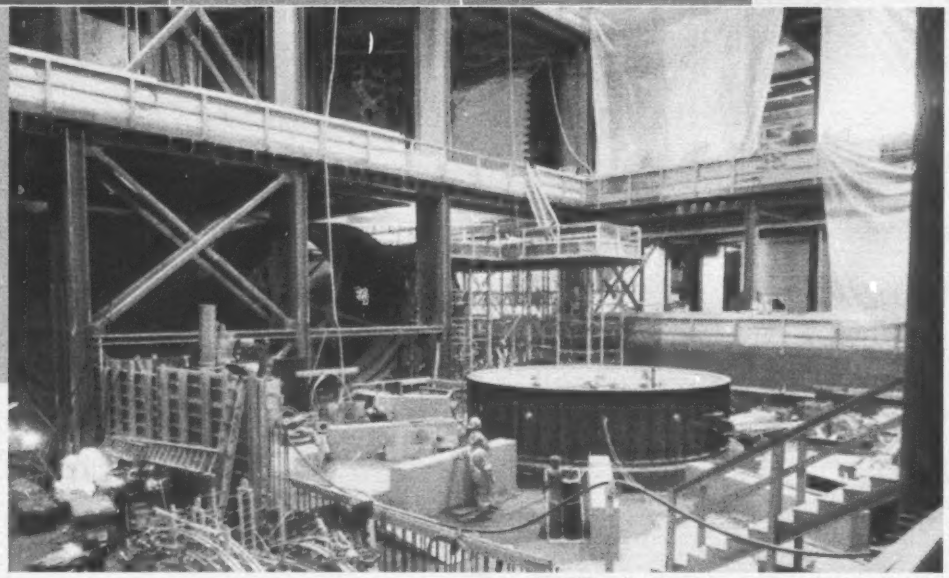
PLANNED AVERAGE ANNUAL OUTPUT
8.0 TWh

ECONOMIC SPINOFFS
$3.5 billion for Québec as a whole, including $1.3 billion for the region

UNIT COST
6.0¢/kWh (including transmission system costs)

EXCLUSIVE WEB CONTENT

- Project Web site **(in French only)**
- Le SYNCHRO newsletter **(in French only)**
- Nui Uapaten newsletter **(in French only)**
- Romaine information bulletins **(in French only)**



Romaine-1 generating station, currently under construction, with commissioning scheduled to begin in 2015.

Launched in 2009, the Romaine project, which includes four hydroelectric generating stations, was favorably received by Minganie's elected officials and socio-economic authorities, as well as Innu communities. Four partnering agreements were signed, promoting the long-term development of the communities well beyond the project's construction period.

The project has been subject to environmental monitoring since construction began in 2009. In addition to the mitigation measures implemented throughout the work, studies will be carried out until 2040 to examine wildlife, vegetation, the physical characteristics of the river and the economic and social impacts of the project on local communities and their land use. The environmental follow-up will allow us to assess the effectiveness of the measures implemented, monitor changes in the environment, verify the effects of the project and increase our knowledge.

ReNew Canada magazine ranked the Romaine complex as the third-biggest infrastructure project under way in Canada in 2015.

Romaine project (continued)

LISTENING TO THE COMMUNITY

- The three agreements signed with the communities of Ekuanitshit, Nutashkuan, and Unamen Shipu and Pakua Shipi were monitored by Innu–Hydro-Québec joint ventures, which manage the funds provided by the agreements and act as permanent forums for exchanges and coordination.
- Under an agreement signed with the regional county municipality (MRC) of Minganie, an annual $2.5 million will be paid to the MRC for 50 years beginning with the commissioning of Romaine-2 generating station in 2014, and an extra $3.7 million per year will be added to this amount once Romaine-4 starts up in 2020.
- In 2014, while Romaine 2 reservoir was being filled, major efforts were expended to inform land users of changes in the area caused by impoundment.
- The members of the Ekuanitshit technical and environmental committee visited Romaine 2 reservoir and the Romaine-1 jobsite.

PROGRESS IN 2014

ROMAINE-1 GENERATING STATION

270 MW (commissioning: 2015–2016)

- The diversion tunnel went into operation.
- Concreting of the generating station progressed to 85%.
- Installation of the two generating units began.
- Dam construction was completed.
- Clearing of the reservoir was completed.

ROMAINE-2 GENERATING STATION

640 MW (commissioning: 2014)

- The reservoir was impounded.
- Both generating units were commissioned.

ROMAINE-3 GENERATING STATION

395 MW (commissioning: 2017)

- The temporary diversion tunnel went into operation.
- Construction of the cofferdams.
- Excavation for the generating station, penstocks and spillway was completed.
- Excavation of the headrace tunnel began.
- Mista workcamp reached a capacity of 1,322 people.

ROMAINE-4 GENERATING STATION

245 MW (commissioning: 2020)

- Geotechnical surveys were carried out.

2014 HIGHLIGHTS

- Jobs created: 1,608 person-years (Côte-Nord workers accounted for 42% of the workforce and Innu workers, for 12%). ✓
- Annual investment in generation (not including financing): $664 million. ✓
- Contracts awarded in the region: $105 million. ✓
- 106 government approvals were received, as well as eight legal non-compliance notices for which corrective measures have been or are now being implemented. ✓
- Composting activities continued at Murailles and Mista workcamps: some 118,500 kg of organic waste and 52,000 kg of cardboard were diverted from landfill. The compost will be used in restoring the work sites.
- The administrative building at Murailles workcamp was certified Ici on recycle ! (in French only), level 2, by Recyc-Québec, following the implementation of measures for waste reduction, reuse and recycling.

EXAMPLES OF ENVIRONMENTAL MANAGEMENT ACTIVITIES IN 2014

MITIGATION MEASURES

Wildlife monitoring

- During the impoundment of Romaine 2 reservoir, periodic flyovers were conducted to ensure that animal survival (moose, forest-dwelling woodland caribou, bears, wolves, lynx and beavers) was not compromised by the rising waters.

Cultural value of beaver

- Beaver trapping was carried out on the site of the future Romaine 1 reservoir, in collaboration with the Innus of Ekuanitshit. This measure allowed us to draw on Innu knowledge and distribute the game in the community of Ekuanitshit.

Atlantic salmon

- An ecological instream flow was maintained during impoundment of Romaine 2 reservoir to protect salmon habitat below Romaine-1 generating station, located a few kilometres downstream. Moreover, salmon habitats were developed at this same location to promote the long-term survival of this species.

Romaine project (continued)

Lake trout production

- In preparation for the stocking of Romaine 1 reservoir planned for 2016, lake trout spawners were captured from a lake and transported to a fish farm, where the females' eggs will be artificially inseminated and incubated.

Innu cultural heritage and harvesting of medicinal plants

- Medicinal plants were gathered in the area of the future Romaine 4 reservoir to supply the Ekuanitshit community pharmacy.

Snowmobiles

- In response to changes in the ice cover on the Romaine following the commissioning of Romaine-2 generating station, a snowmobile bridge was built at kilometre point 30.5, allowing snowmobilers to cross the river and continue their activities. A snowmobile trail was also built on the right bank to allow the Innus of Ekuanitshit to continue trapping.

Archaeology

- Archaeological digs were carried out on a dozen sites in the area of the future Romaine 4 reservoir. Many traces of Aboriginal occupation were uncovered, ranging from recent periods to 6,600 years ago.

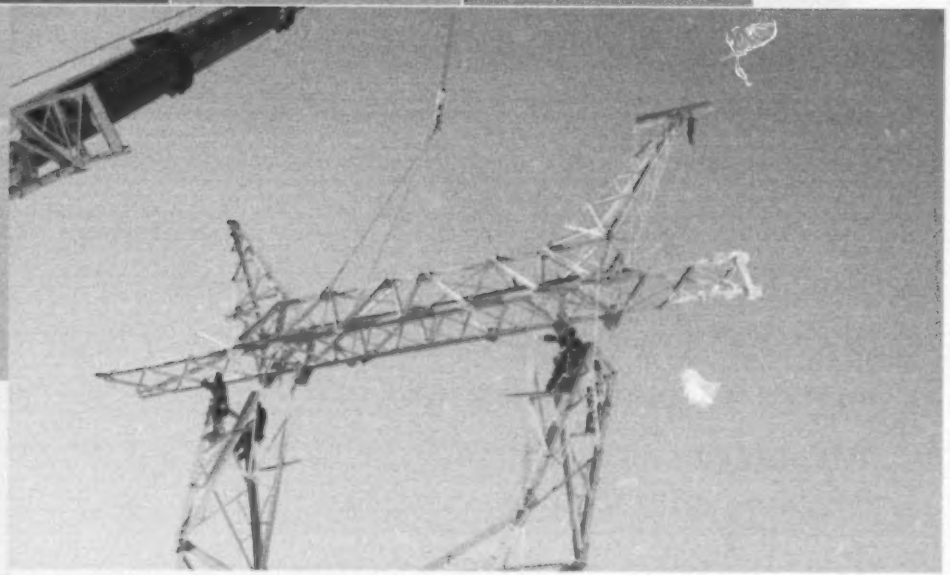
PARTNERSHIPS WITH COMMUNITIES

Information on the project and results of environmental follow-ups

- Information campaigns on water-level changes in the Rivière Romaine during the filling of Romaine 2 reservoir and the commissioning of the generating station were carried out for land users and the public. The campaigns included information on land use, navigation, ice cover, snowmobile travel and the different mitigation measures implemented.
- Three issues of the Nui Uapaten newsletter (in French only), covering the activities of Innu workers on the jobsite, were distributed to the four Innu communities affected by the Romaine project.
- Côte-Nord Économique, an organization coordinated by the Conférence régionale des élus de la Côte-Nord, put the Bottin des entreprises régionales [phone book of regional companies] (in French only) to new use as a qualifying tool for regional companies. Companies registered in the phone book are now automatically approved as subcontractors.
- The committee responsible for awarding and monitoring contracts with Aboriginal communities held periodic meetings.
- To help increase the number of Innu workers on the jobsite, an employment counselor was hired to provide contractors with a list of Innu applicants interested in working and to inform Innu communities of the work available.
- For major projects in resource regions like Côte-Nord, calls for proposals are limited to the region, provided that competition is sufficient. Major contracts also include a regional subcontracting clause.

Mitigation measure: Atlantic salmon spawning and rearing grounds developed in the Romaine

Expansion of the transmission system in Minganie: Connecting facilities to the transmission grid



Construction proceeds on the Romaine-1–Romaine-2 line, part of the project to expand the transmission system in Minganie.

STATUS
Under construction

FACILITIES
- 315-kV Romaine-1–Romaine-2 line
- 735-kV Romaine-2–Arnaud line
- 735-kV Romaine-3–Romaine-4 line
- 735-kV Romaine-4–Montagnais line
- 315/161/13.8-kV Romaine-1 substation
- 735/315/18-kV Romaine-2 substation
- 315/13.8-kV Romaine-3 substation
- 315/13.8-kV Romaine-4 substation
- 735-kV Arnaud substation
- 735-kV Montagnais substation

COST
$1.3 billion

REGION
Côte-Nord

CONSTRUCTION
2011–2020

EXCLUSIVE WEB CONTENT
- Project fact sheet

The project to expand the transmission system in Minganie calls for the construction of four new 315-kV and 735-kV lines (about 500 km) and four new substations, and will entail modifications at Arnaud and Montagnais substations. It will allow the hydropower output from the Romaine complex to be brought onto the main transmission grid.

During project design and line route selection, Hydro-Québec instituted a public consultation program to integrate the host community's concerns. As a result, the company undertook to maximize economic spinoffs, which were identified as a primary concern for the local population. Regional

LISTENING TO THE COMMUNITY

Harmonious cohabitation of land users and jobsite workers:

- Workers were educated about Innu land use.
- Public notices about the jobsite's activities were issued for land users.
- Regular follow-ups were carried out with the region's cottagers.

Expansion of the transmission system in Minganie: Connecting facilities to the transmission grid (continued)

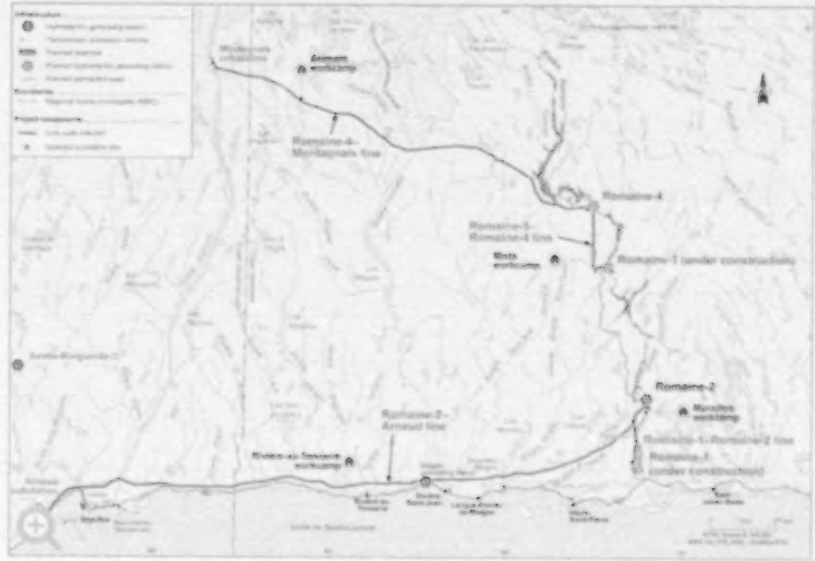
spinoffs are achieved through contracts, procurement of goods and services, workforce hiring and a variety of local accommodation services.

In response to concerns expressed by the host community, Hydro-Québec modified sections of its initial line route between Romaine-2 and Arnaud substations. The main reasons for the line route optimization were the presence of cottages and an outfitter, and a natural reserve project near Arnaud substation.

Transmission line construction projects are subject to environmental monitoring that is carried out at different stages (geotechnical surveys, right-of-way clearing, construction and site restoration) to ensure compliance with the environmental clauses and mitigation measures selected during project design. One of our tools, the environmental compliance monitoring guide, provides graphic representations of sensitive elements and helps us quickly locate them in the project area. Nine environmental compliance monitoring guides have been produced since the start of the project.

2014 HIGHLIGHTS

- Jobs created: 342 person-years (Côte-Nord workers accounted for 40% of the workforce and Innu workers, for 4%). ✓
- Annual investment (not including financing): $215 million.
- Contracts awarded in the region: $66 million. ✓
- 89 government approvals were received, as well as one legal non-compliance notice for which corrective measures have been or are now being implemented. ✓
- The Romaine-2–Arnaud line and Romaine-2 and Arnaud substations were commissioned.
- Clearing of the Romaine-1–Romaine-2 line right-of-way was completed.
- Clearing began on the Romaine-3–Romaine-4 line right-of-way.
- Clearing continued on the Romaine-4–Montagnais line right-of-way.
- Construction of Romaine-1 substation is under way.
- We opened Belmont workcamp.



EXAMPLES OF ENVIRONMENTAL MANAGEMENT ACTIVITIES IN 2014

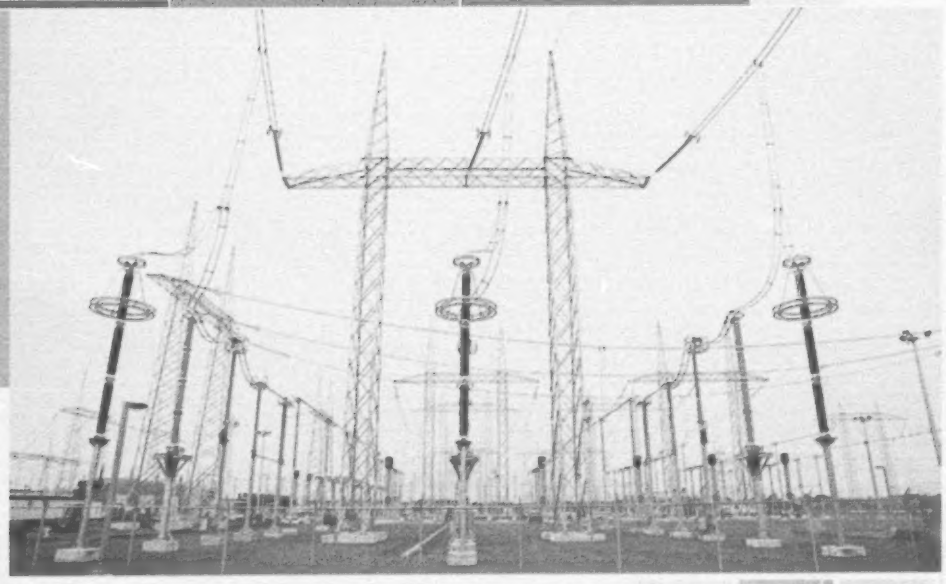
MITIGATION MEASURES

- Clearing methods tailored to sensitive environments were applied.
- Educational posters about forest-dwelling woodland caribou were distributed to workers.
- Inventories of archaeological artifacts and special-status plants were conducted for borrow pits.
- Certain access roads were restored to facilitate cohabitation with land users.

ENVIRONMENTAL FOLLOW-UP

- We began the wetlands follow-up for the Romaine-2–Arnaud and Romaine-4–Montagnais lines, which will assess the impact of tower construction on peatlands.

Reinforcement of the transmission system in the northeast Montréal metropolitan region



Redevelopment of Bout-de-l'Île substation, in Montréal: a compensation plan was produced to make up for the loss of land earmarked for forestry.

STATUS
Under construction

FACILITIES
- 315-kV Mauricie–Lanaudière line
- 315-kV tap line for Lachenaie substation
- 120-kV Pierre-Le Gardeur–Saint-Sulpice line
- 735/315/120-kV Bout-de-l'Île substation
- 315/25-kV Lachenaie substation
- 315/120-kV Pierre-Le Gardeur substation
- 315/120/25-kV Bélanger substation and 315-kV tap line

COST
$644 million

REGIONS
Montréal and Lanaudière

CONSTRUCTION
2012–2015

EXCLUSIVE WEB CONTENT
- Mauricie–Lanaudière line
- Bout-de-l'Île substation
- Pierre-Le Gardeur substation
- Bélanger substation

Configured with 315-kV and 120-kV facilities in the late 1950s, the transmission system in the northeast Montréal metropolitan region received its first 735-kV equipment in 1965. It is supplied by three main source substations. Duvernay (735/315/120 kV) and Bout-de-l'Île (315/120 kV) substations serve eastern Montréal; Duvernay and Lanaudière (315/120 kV) substations serve the south of Lanaudière. These facilities are connected to 26 satellite substations (120/25 kV) that supply the distribution system.

To meet demand growth in the northeast Montréal metropolitan region, Hydro-Québec had to increase the transformer capacity of the region's source and

LISTENING TO THE COMMUNITY
- Projects were integrated into the urban environment.
- An information bulletin on the construction work was published.
- For the Bout-de-l'Île substation project, the Rivière-des-Prairies–Pointe-aux-Trembles borough received $1 million to carry out initiatives to enhance the living spaces of its residents (Integrated Enhancement Program).

Reinforcement of the transmission system in the northeast Montréal metropolitan region (continued)

satellite substations. These projects will strengthen the transmission system supplying customers in eastern Montréal and Lanaudière.

The new Bélanger substation was built southwest of the existing substation, on a piece of land large enough for an indoor substation made up of three buildings. Most of the new electrical equipment is housed inside these buildings, except for two 315/120-kV latest-generation transformers installed outdoors and equipped with acoustic enclosures. Once the conversion plan is finalized, six transformers—noisier than the ones replacing them—and other equipment will have been dismantled. Ultimately, the property will be occupied mainly by the buildings of the indoor substation.

The Mauricie–Lanaudière line route (5 km) was optimized to limit visual impact. The route selected from the two variants studied crosses an industrial park, running first along a highway and then along a 120-kV line. This option preserves the existing vegetation screen between the highway and a residential neighborhood, while limiting the poles' visual impact for residents.

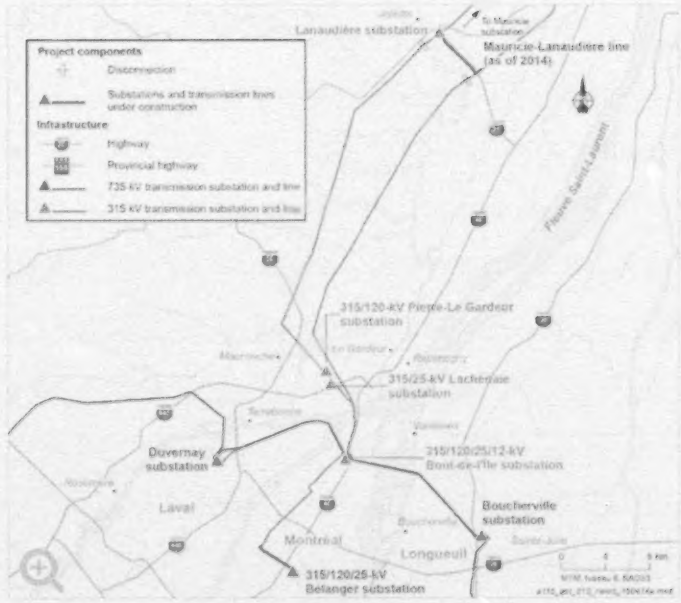
2014 HIGLIGHTS

- Construction continued at Bout-de-l'Île substation.
- Pierre-Le Gardeur substation was commissioned.
- We began construction of the Mauricie–Lanaudière and Lachenaie–Pierre-Le Gardeur lines.
- Construction of Bélanger substation and tap line was completed.

EXAMPLES OF ENVIRONMENTAL MANAGEMENT ACTIVITIES IN 2014

MITIGATION MEASURES

- Enhancements for plants and wildlife were implemented over an area of about 12 ha in a line right-of-way north of Bout-de-l'Île substation. Plant enhancements included seeding and the planting of over 13,000 shrubs of 14 different species. Six species of tall trees were also planted at the edges of the right-of-way to create a screen. Measures were applied to control common reed, an invasive species, and ragweed, a species harmful to human health. Wildlife enhancements included nesting boxes, hibernation sites for non-venomous snakes, trunks left on the ground and different shelters for small wildlife.
- Trees were planted over an area of 5.6 ha (1.1 ha to come in 2015) to compensate for the loss of woodland caused by construction of the Mauricie–Lanaudière line.
- We drew up a plan to compensate for the loss of some land earmarked for forestry as a result of the redevelopment of Bout-de-l'Île substation.
- We developed a plan to compensate for the loss of wetlands and wooded areas caused by the construction of Pierre-Le Gardeur substation and the Lachenaie–Pierre-Le Gardeur line.
- We installed white roofs to curb the urban heat island effect, and designed and built filter marshes and a retention pond to remove suspended solids from rainwater at Henri-Bourassa substation.



Follow-up on projects in operation

The purpose of an environmental follow-up on projects in operation is threefold: assess the real environmental impacts of the project, compare them with the anticipated impacts and determine the effectiveness of mitigation and enhancement measures. The lessons learned are used to improve environmental assessment procedures.
Some follow-up continues for as long as 20 years after a project starts operation. Here are a few examples.

SPAWNING GROUND DEVELOPMENT AND FISH PROTECTION

Spawning grounds are sites where fish reproduce. The development of spawning grounds helps preserve fish species present in construction areas.

Eastmain/Sarcelle/Rupert complex (Nord-du-Québec)

- The goal of the follow-up on the integrity and use of spawning grounds is to assess whether the instream flow preserves and ensures the spawning success of target species at these spawning grounds in the reduced-flow stretch of the Rupert. The target species are longnose sucker, white sucker and walleye for spring spawning and lake whitefish for fall spawning. No signs of physical deterioration of the spawning grounds were detected. The presence of walleye and sucker eggs and lake whitefish larvae in the developed spawning grounds confirms that they are being used.
- This follow-up also aims to describe the changes in the Eastmain's fish populations resulting from the impacts of the commissioning of Eastmain-1-A powerhouse. Nine species were caught in 2013, with northern pike being the dominant species in terms of both abundance and biomass. Species diversity remained the same, but there was a 23% drop in the quantity caught compared to the 2008 baseline. Ten sturgeons were caught in the study area in 2013. Two were caught upstream of kilometre point 207, after having been tagged downstream, confirming that this species is migrating through the fish pass. The 2015 follow-up will help us better understand the changes observed in fish population structure.

Monitoring of the spawning grounds of various target species at kilometre points 216 and 281 on the Rupert (Baie-James).

EXCLUSIVE WEB CONTENT

- Environmental follow-up
- Summary of environmental knowledge

DURATION OF ENVIRONMENTAL FOLLOW-UPS

DEVELOPMENT OR PROJECT	REGION	COMMISSIONING	END OF FOLLOW-UP	DURATION OF FOLLOW-UP (years)
Sainte-Marguerite-3	Côte-Nord	2003	2016	19
Toulnustouc	Côte-Nord	2005	2016	15
Partial diversion of the Rivière Manouane	Mauricie	2003	2016	17
Péribonka	Saguenay–Lac-Saint-Jean	2007–2008	2018	14
Chute-Allard	Mauricie	2008–2009	2018	13
Rapides-des-Cœurs	Mauricie	2008–2009	2018	13
Eastmain/Sarcelle/Rupert	Nord-du-Québec	2011–2012	2023	16

Follow-up on fish populations in the Chute-Allard and Rapides-des-Cœurs forebays (Mauricie).

Chute-Allard and Rapide-des-Cœurs developments (Mauricie)

- The species composition of fish communities in the Chute-Allard and Rapides-des-Cœurs forebays has shown little variation since 2002 (walleye and northern pike).
- In spring 2013, five years after the impoundment of the Rapides-des-Cœurs forebay, about 69% of the areas developed for walleye spawning were being used.
- After three years of monitoring the population of brook trout in creeks, no change has been observed.

Péribonka development (Saguenay–Lac-Saint-Jean)

- The follow-up on the integrity and use of the two spawning grounds for lake trout in the Péribonka reservoir showed that the area has been stable since impoundment and that the quality of the substrate has improved compared with previous years. Organic matter deposits are still present in one of the spawning grounds, while almost all of the surface area of the other (488 m^2) is suitable for spawning. The results suggest that the developed spawning grounds were not used by lake trout in 2013. However, 16 spawners were caught in the riprap section of the Péribonka bridge.

MERCURY

Reservoir impoundment alters the aquatic environment by transforming and circulating the mercury already present in the flooded vegetation and soil. The result is an initial increase in fish mercury levels, which then return to baseline levels within 10 to 35 years.

Chute-Allard and Rapide-des-Cœurs developments (Mauricie)

- Results obtained five years after the impoundment of the forebays showed that, in certain species, fish mercury was higher than the levels anticipated by the impact assessment. For more information, see page 61.

HUMAN ENVIRONMENT

Combined with information and consultation activities, studies of the human environment (land use, social impacts, economic spinoffs, navigation activities, etc.) help Hydro-Québec better understand the concerns and needs of host communities.

Chute-Allard and Rapide-des-Cœurs developments (Mauricie)

- In 2013, cottage use was comparable to what it was during draft design (2003) and construction (2008). Cottagers mainly reside in the hamlets of Windigo, Vandry and Ferguson, and continue to use their cottages year-round. More frequent and longer stays were recorded in 2013 compared with previous years. Compared with 2003, more users are focusing their activities along the banks of the Saint-Maurice. Brook trout is now the number one fish species caught, replacing walleye and northern pike, which were most popular in 2003. Walleye fishing has decreased by more than half.

COMEX REPORT ON THE EASTMAIN-1-A/SARCELLE/RUPERT PROJECT

After consulting approximately 200 people in the six Cree communities affected by the Eastmain-1-A/Sarcelle/Rupert project, the provincial review committee (COMEX), which is in charge of reviewing projects located in the Baie-James region south of the 55th parallel, made the following observations:

- The project is unprecedented in terms of the number of mitigation and compensation measures implemented, both environmentally and socially.
- The project promoted better understanding between the parties and greater Cree participation in developing the region.
- The proponent was proactive in limiting the project's impacts as much as possible and ensuring a greater degree of Cree contribution to the environmental and social follow-ups.

Cree workers participated in the lake sturgeon spawning follow-up on the Rupert (Baie-James).

Eastmain/Sarcelle/Rupert complex (Nord-du-Québec)

- Cree land users from Nemaska and Mistissini were consulted on the navigation conditions in the Rupert diversion bays and the effectiveness of the mitigation measures implemented. The users consulted consider the development and marking of navigation corridors very useful measures, especially for occasional users who are not familiar with the area. For their own purposes, since they are familiar with the area, they rely on specific landmarks and know where the obstacles and more dangerous spots are. They are slowly extending their harvesting areas and navigating over longer distances. They plan to return to navigating on the diversion bays in the coming years.

Péribonka development (Saguenay–Lac-Saint-Jean)

- The survey data on land use by the Innus of Mashteuiatsh and the comparison with the impacts anticipated during project design show that adaptation to the new environment has not really begun and that no traditional trapping activities have been practised at Péribonka reservoir. However, land-use related mitigation measures are generally appreciated. For example, the fund provided by Hydro-Québec for the promotion of traditional activities was used to create the Innu Aitun program, which has been successfully supporting land occupation and knowledge transfer from elders to youth for the past four years.

BANK EROSION AND ICE MONITORING

Erosion is a dynamic process influenced by natural factors such as wind and currents. Various measures are implemented during project construction to protect banks and limit their erosion, with a view to preserving wildlife and plant species that live there.

Eastmain/Sarcelle/Rupert complex (Nord-du-Québec)

- Ice cover follow-up was carried out in winter 2012–2013 in cooperation with the Crees using two parallel techniques, GPR profiling and conventional sampling—a first. This new tool was used to confirm and complete results from regular sampling.

Toulnustouc development (Côte-Nord)

- During winter 2012–2013, we conducted the third and final ice regime follow-up to document ice cover on the Toulnustouc between Toulnustouc dam and Manic 2 reservoir. By comparing with previous follow-up results, we determined that, in the reduced-flow stretch of the river, the ice cover has increased significantly since the generating station was commissioned, due to the lower, more stable flows.

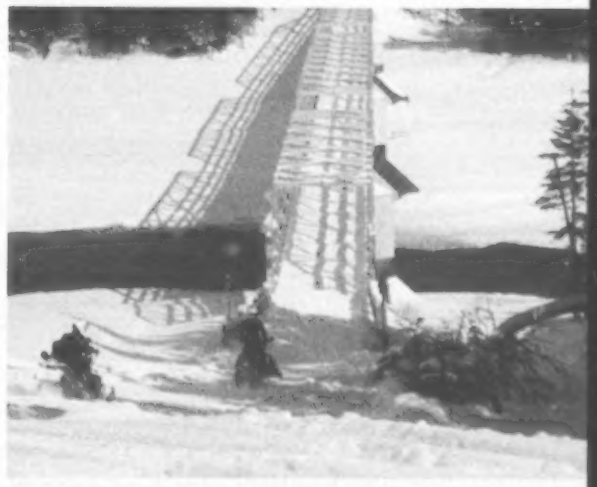
Rivière Rupert, near Waskaganish, where an ice cover follow-up is ongoing.

Conversely, the ice has almost disappeared in the stretch between the generating station's tailrace canal and kilometre point 23, due to the warmer waters discharged from the generating station in winter.

Note: Most of the follow-up activities in this section were carried out in 2013.

ACCEPTABILITY AND SPINOFFS FROM PROJECTS AND OPERATIONS

Operation of the Romaine complex will create one hundred new jobs in Minganie.



A new snowmobile bridge at kilometre point 30.5 downstream from Romaine-1 generating station was built by Hydro-Québec in response to community concerns.

Hydro-Québec's projects and operations have impacts on local communities and on the Québec economy as a whole. The company makes a point of cultivating acceptance of its operations by mitigating their negative effects and optimizing positive impacts. It also strives to ensure that its projects are profitable, environmentally acceptable and favorably received by the host community.

Every project is unique and the measures taken to promote social acceptability may vary depending on the host community's expectations. A project's social acceptance does not necessarily mean there is no opposition, but rather that as broad a consensus as possible has been achieved. By securing public participation and stakeholder partnerships, Hydro-Québec encourages the communities to collaborate on planning its projects and contribute to development of the conditions that make them acceptable and mutually beneficial.

PUBLIC PARTICIPATION

More than 30 years ago, in the wake of its major construction projects in Baie-James, Hydro-Québec introduced a public participation process. The process has evolved over the years and is intended to harmonize generating or transmission facilities with their host environments by taking stakeholders' concerns and opinions into consideration when decisions are made. The approach respects the company's objectives and resources while allowing the choice of the variant with the lowest

EXCLUSIVE WEB CONTENT

- Public participation in major transmission projects
- Construction projects – Power Transmission
- Romaine project
- Undergrounding programs **(in French only)**
- Landscape and versatility of facilities
- Archaeology and heritage

social, environmental, technical and economic impact and encouraging projects that meet the host community's needs and expectations. For a major generation project, the public participation process often results in partnership agreements with the communities concerned.

2014 HIGHLIGHTS

- We signed a new agreement with the Union des producteurs agricoles (UPA) (in French only) on the passage of transmission lines through farmland and forests. During the 1980s, Hydro-Québec and the UPA set up a joint-action committee—which later became the Hydro-Québec–UPA liaison committee—to develop a standard method for compensating farmers affected by transmission system construction. A first agreement was signed in 1986 and a first in-depth review was completed in 1999. The 2014 agreement is the result of a second full review. It sets rules for transmission equipment projects (lines, towers, substations) in farmland and forests, as well as related compensation measures.
- The Hydro-Québec and Fédération québécoise des municipalités liaison committee celebrated its 15th year. Through the exchange of information, discussion of viewpoints and in-depth examination of issues, the liaison committee's work results in productive collaboration and common positions on topics of interest to both parties.
- We studied or completed over 1,600 construction projects. The project development stage provides an opportunity to use and continually improve the ways we inform and consult host communities, thereby

PUBLIC PARTICIPATION IN A MAJOR PROJECT

	PLANNING	DRAFT DESIGN AND PERMITTING	CONSTRUCTION	OPERATION
GENERATION	■ Preliminary discussions with regional county municipalities and Aboriginal communities with a view to signing agreements ■ Identification of basic expectations and issues ■ Duration: 1 to 2 years	■ Information and discussion panels ■ Continuous communications (open house events, information meetings, media relations, etc.) ■ Public consultation by government authorities ■ Duration: 2 to 5 years	■ Regional economic spinoffs committees ■ Environmental and agreement monitoring committees ■ Public information on work progress (bulletins, press releases, etc.) ■ Duration: varies, 2 to 12 years	■ Environmental and agreement monitoring committees ■ Follow-up duration: varies, exceeds 20 years for the Romaine project
TRANSMISSION	■ Evaluation of communication tools based on the host community and type of project ■ Duration: 1 to 2 years	■ Three communication phases implemented by project teams: □ general information □ information and consultation □ information about the solution selected ■ Various communications activities (open house events, information meetings, media relations, etc.) ■ Public consultation by government authorities[a] ■ Duration: 2 to 5 years	■ Public information on project progress (bulletins, press releases, Info-project line, etc.) ■ Duration: 1 to 5 years	■ As needed, communication with the communities affected

a) For projects of at least 315 kV and more than 2 km.

enabling us to enhance our projects and tailor them to local realities.

RELATIONS WITH ABORIGINAL COMMUNITIES

Many Aboriginal communities live in areas with high hydroelectric potential. Hydro-Québec seeks to develop mutually beneficial partnerships with these communities. For example, we call upon their knowledge of the natural environment when conducting environmental inventories and implementing mitigation measures.

Québec's 11 Aboriginal nations, in 55 communities, each have different cultures and lifestyles. Over the years, Hydro-Québec has developed a number of communication approaches (radio broadcasts, Web microsite, environmental follow-up schedules, newsletters, etc.) that have helped consolidate its relationships with these communities.

2014 HIGHLIGHTS

- Partnership activities related to the Romaine project were conducted with Côte-Nord Innu communities. (p. 37)

EXAMPLES OF PUBLIC PARTICIPATION IN 2014

PROJECT	STATUS	DESCRIPTION	ACTIVITIES
New bridge for the St. Lawrence – Moving a segment of the 315-kV Hertel-Viger line (Montérégie)	Under construction	▪ Relocation of part of the 315-kV line in Brossard to clear the corridor for the new Champlain Bridge	Open house events were organized jointly with Infrastructure Canada for citizens living near the site to answer their questions about construction of the new Champlain Bridge and relocation of part of the Hertel-Viger line.
120-kV Grand-Brûlé–Saint-Sauveur supply line (Laurentides)	Under study	▪ Construction of an approximately 40-km, 120-kV line in the MRCs of Laurentides and Pays-d'en-Haut to transfer the power supply for Saint-Sauveur and Doc-Grignon (Sainte-Adèle) substations to Grand-Brûlé source substation (Mont-Tremblant) and supply a third satellite substation.	Since June 2012, more than 85 meetings have been held with elected officials and community managers and representatives, including eight open house events for landowners and citizens, nine meetings of the regional technical committee and nine meetings of its subcommittees. ✔ However, some Saint-Adolphe-d'Howard residents are still concerned about the planned line's visual impact. A regional technical committee of experts delegated by the various municipalities was formed in 2013 to recommend a lower-impact solution that would reconcile the community's concerns with Hydro-Québec's obligations. The company submitted an optimized route to the committee and consulted the public in fall 2014.
735-kV Chamouchouane–Bout-de-l'Île project (Saguenay–Lac-Saint-Jean, Mauricie, Lanaudière and Montréal)	Under study	▪ Construction of a 400-km, 735-kV transmission line from Chamouchouane substation (Saguenay–Lac-Saint-Jean) to the future Judith-Jasmin substation (Terrebonne). ▪ Construction of the 735-kV Judith-Jasmin substation. ▪ Diversion of a section of an existing 735-kV line to Bout-de-l'Île substation in Montréal ▪ Purpose: eliminate the funnel effect at Chamouchouane and Saguenay substations, maintain transmission system reliability and security, and meet growing transmission needs.	Since the project began in 2010, more than 300 meetings and discussions with communities and local elected representatives have been held, as well as about 15 open house events. The communication tools used included 14 information bulletins, a new Web site, inventory maps and the Google Earth app. All the information was given to the public concerned and comments were collected. After a series of environmental and technical studies and meetings, Hydro-Québec made a number of changes in the project to respond to the public's concerns. Among other things, it took into account the expectations expressed about the addition of a new line corridor west of the initial route in southern Lanaudière. The company also grouped the power lines in the same corridor, avoided a wildlife reserve and circumvented wetlands.

- Under the *La Grande Agreement (1986)*, as many Cree workers as possible were hired and trained for Baie-James operations. Four types of jobs were targeted: power system electrician, powerhouse mechanic, automation electronics technician and telecommunications technician. In 2014, the company hired 16 new Cree employees, bringing the total number of Crees working for Hydro-Québec in Baie-James to 73. (Nord-du-Québec) ✔
- 164 employees ✔ participated in an in-house training program about Aboriginal nations and communities and Hydro-Québec's business relations with them. Training was given at the Romaine project's Murailles and Mista workcamps. (Côte-Nord)
- We played an active role in Niskamoon Corporation, the firm created and operated by Crees to administer the various agreements between the Crees and Hydro-Québec. The company's board includes three Hydro-Québec directors. (Nord-du-Québec)
- The Eastmain-1-A/Sarcelle/Rupert Environmental Follow-up Program continued, in collaboration with the joint Cree–Hydro-Québec Monitoring Committee. (Nord-du-Québec)

SPINOFFS FROM PROJECTS AND OPERATIONS

Hydro-Québec's investments, procurement, dividends paid to the Québec government and consulting-engineering expertise make it a major driving force in the Québec economy. Every year, the spinoffs from its operations generate billions of dollars and thousands of jobs, contributing to the economic vitality of many regions of the province.

Hydro-Québec encourages local subcontracting and issues calls for tenders from local companies for contracts under $1 million, on the condition that the principles of competition are upheld.

Regional economic spinoffs committees are also set up to ensure that local economic associations are informed about tender calls and project spinoffs. The committees also help monitor the measures implemented.

HYDRO-QUÉBEC'S CONTRIBUTION TO THE QUÉBEC ECONOMY

	2011	2012	2013	2014
Dividend ($M)	1,958	645	2,207	2,535
Public utilities tax ($M)	244	252	245	252
Water-power royalties ($M)	593	617	669	656
Municipal and school taxes ($M)	35	36	36	37
Procurement from Québec-based companies (%)	93	94	95	94
Community investments ($M)[a]	30	29	31	30

a) Community investments are described on page 66.

LISTENING TO COMMUNITIES

Since 1975, Hydro-Québec has signed some 30 agreements with Aboriginal nations and communities in connection with hydropower development projects. These agreements have enabled Aboriginal communities to play an active part in project construction, work on environmental follow-up programs and benefit from economic spinoffs.

4% OF GDP

In Québec, the value added in 2014 by the power generation, transmission and distribution industry was estimated at about $12.3 billion.[a] Since Hydro-Québec accounts for over 90% of this industry, its stake in the province's economy is about 4% of the gross domestic product (GDP).

a) Estimated value, in current dollars. Excludes Hydro-Québec's construction activities, R&D and subsidiaries' operations.

Sources: Hydro-Québec, Statistics Canada and Institut de la statistique du Québec.

2014 HIGHLIGHTS

- Procurement of goods and services inside and outside Québec (excluding procurement by Société d'énergie de la Baie James) totaled $3,301 million ($3,533 million in 2013):
  - $1,251 million for the purchase of goods
  - $29 million for rentals and leasing
  - $1,675 million for specialized services and other work
  - $346 million for professional services
- Procurement of goods and services from Québec businesses was $3,112 million (94% of the total).
- Nine Côte-Nord regional economic spinoffs committee meetings were attended by local economic leaders, including representatives of the Innu and Mingan communities that signed agreements. They worked on improving business practices, sought new business opportunities for the region and organized information activities.

LAND USE

In addition to being the second-largest landowner in Québec after the Québec government, Hydro-Québec owns facilities and infrastructure throughout the province. The company also operates many reservoirs, dams and control structures, preserves the water bodies' quality and shares their use.

Historically, power system expansion has influenced land use and development. For this reason, we actively collaborate in various land use planning initiatives: urban planning, land use plans, master plans for water and public land-use planning.

2014 HIGHLIGHTS

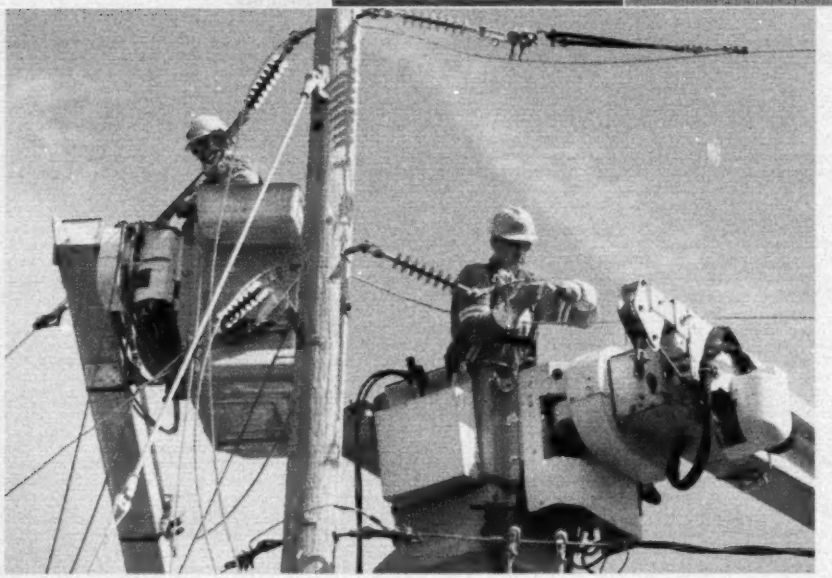
- The Rupert River Water Management Board, composed of Cree and Hydro-Québec representatives, is responsible for maintaining the instream flow regime and operating the Rupert spillway control structure on the basis of data from the Eastmain/Sarcelle/Rupert Environmental Follow-up Program. The Board continued analyzing issues related to the heavy precipitation in 2014 and 2012 and implementing a communication strategy that informs Cree users about instream flows in the Rupert. (Nord-du-Québec)
- The MRC of Beauharnois-Salaberry was authorized to construct a bird-watching platform beside the Beauharnois canal. The platform was built on the dike of a lagoon operated by Ducks Unlimited Canada and enhances the Oie des Neiges interpretation area developed in 2012. (Montérégie)

Photo: MRC of Beauharnois-Salaberry

^^ Signature of the new Hydro-Québec–UPA agreement on the passage of transmission lines through farmland and forests: Pierre Lemieux, UPA Senior Vice President, Marcel Groleau, UPA President, André Boulanger, President of Hydro-Québec TransÉnergie, and Yves Galipeau, Customer Communications Manager at Hydro-Québec.

^ With Hydro-Québec's permission, the MRC of Beauharnois-Salaberry installed a bird-watching platform beside the Beauharnois canal in Montérégie.

RESPONSIBILITY FOR ELECTRICITY SERVICE



Line worker Ludovic Robert and line crew chief Patrick Robillard work on the distribution system in Fabreville, Laval.

In addition to guaranteeing a reliable electricity supply for Quebecers, Hydro-Québec invests in facility development, reliability and long-term operability in order to provide high-quality service. It responds to the needs of its various clienteles and treats them fairly.

RELIABLE ELECTRICITY SERVICE

Service reliability is measured by the system average interruption duration index (SAIDI), which reflects the average service interruption time per customer. Service interruptions can be caused by scheduled maintenance, bad weather, invasive vegetation or defects in transmission or distribution system equipment.

Hydro-Québec is responsible for an essential service and must deal with all sorts of emergencies, from equipment breakdown to major catastrophes. Emergency response management is an integral part of corporate procedure: the company is a full member of the Organisation de la sécurité civile du Québec and the Organisation régionale de la sécurité civile.

Hydro-Québec also has a support agreement with neighboring distribution systems and cooperates with other North American power utilities when natural disasters occur.

HELP FROM QUÉBEC

On January 26, 2015, a major winter storm hammered the northeastern United States, damaging a number of power systems in the Greater Boston area. That very day, 75 crews of Hydro-Québec line workers and logistical and technical personnel (nearly 180 people) took to the road in a convoy to lend a hand to their American colleagues. Hydro-Québec is a member of the North Atlantic Mutual Assistance Group of power utilities that have agreed to help each other during major outages.

EXCLUSIVE WEB CONTENT

- Vegetation, safety and power lines
- Next-generation meters

Preventive measure: sites were inventoried for upcoming vegetation control operations in Sainte-Marguerite-du-Lac-Masson. (Laurentides)

2014 HIGHLIGHTS

- The SAIDI was 143 minutes per customer (165 minutes in 2013). ✔
- $326 million was invested in refurbishment or optimization of the generating fleet.
- $1.6 billion was invested in long-term operability and expansion of the transmission system.
- $381 million was invested in long-term operability of the distribution system.
- Very positive results were achieved with MILE, an intelligent power line maintenance tool designed to locate hard-to-detect faults so that maintenance can be targeted and outages avoided. The tool was installed on 10 distribution system lines in 2014 and 25 more lines will be equipped in 2015. Since grid testing began, MILE has reduced avoidable outages by 50%, customer-hours of interruption by 60% and outages of unknown cause by 92% on a test line with one of the highest outage rates in Québec.

VEGETATION CONTROL

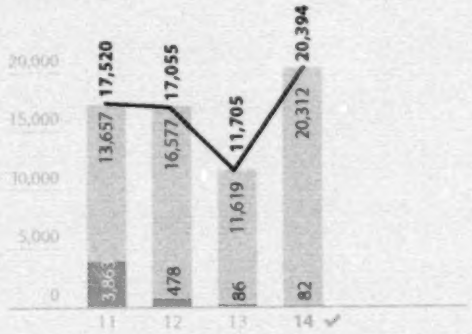
To ensure that service is reliable and its facilities are safe, Hydro-Québec must control the vegetation in its transmission and distribution line rights-of-way and on dikes and dams. Environmental considerations are built into all vegetation control operations. For example, long-term results show that mechanical treatment with rational use of herbicides promotes biodiversity and the growth and maintenance of compatible vegetation in transmission line rights-of-way. No herbicides are used in distribution system maintenance.

For the past three years, we have been using Light Detection And Ranging (LIDAR) technology to compare ground cover height with conductor height in order to determine what operations are required to control vegetation growing in line rights-of-way. The gradual optimization of vegetation inspection in rights-of-way will also support system reliability through improved knowledge of the minimum clearances that are safe for the public, workers and the system.

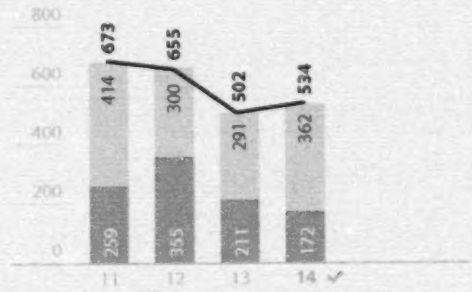
2014 HIGHLIGHTS

- New remote surveys of ground cover in line rights-of-way yielded data that has been added to the company's systems.
- An ongoing research program is improving understanding of vegetation growth in a line right-of-way where seeds were planted to reduce the growth of plant species that are incompatible with system operation. The results so far show that this is an effective type of treatment.

VEGETATION CONTROL ALONG TRANSMISSION LINE RIGHTS-OF-WAY (ha)



VEGETATION CONTROL ON DIKES AND DAMS (ha)



- Area treated selectively with herbicides
- Area treated mechanically
- Total area treated

NEXT-GENERATION METERS

Rollout of the advanced metering infrastructure (AMI) began in 2013 and continued in 2014, with a view to replacing 3.8 million meters with next-generation meters. As at December 31, 2014, we had installed more than 2.5 million meters. Installation of all the new meters should be completed by the end of 2016. Customer satisfaction with respect to meter replacement was 89%.

More than 125 million such meters are already in use worldwide. Reliable and safe, Hydro-Québec's meters are certified by Measurement Canada. They incorporate functions that will improve service: automatic transmission of electricity consumption data, billing based on actual use instead of estimates and fast outage detection.

In accordance with a Régie de l'énergie decision, a residential customer who does not want a next-generation meter installed may opt to pay for the installation of a non-communicating meter that does not transmit data by radiofrequency. The customer must also pay the monthly meter-reading charge. Radiofrequency information is provided on pages 60 and 61.

2014 HIGHLIGHTS

- An application was filed with the Régie de l'énergie to reduce the charges associated with opting not to have a residential next-generation meter installed. The initial installation cost was $98 and the monthly meter-reading charge was $17. The Régie de l'énergie ruling authorized an initial installation charge of $85 and a monthly meter-reading charge of $5.
- The percentage of customers who opted out of installation remained stable at less than 1%.
- Communications activities in areas where the AMI was rolled out included meetings with municipal elected officials, open house events for citizens and a dedicated telephone information service for concerned customers.

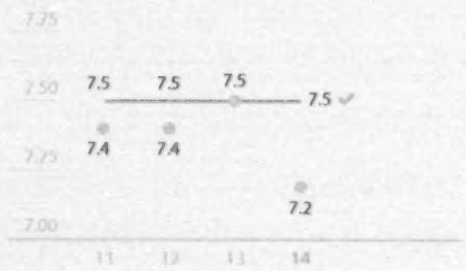
CUSTOMER SATISFACTION

Customer satisfaction—a top priority for Hydro-Québec—has been assessed since 1992 in surveys that inform the company of customers' expectations and degree of satisfaction. In compliance with the *Act respecting the Régie de l'énergie*, a complaints mechanism is in place to enable customers who feel they have been wronged to express their dissatisfaction.

2014 HIGHLIGHTS

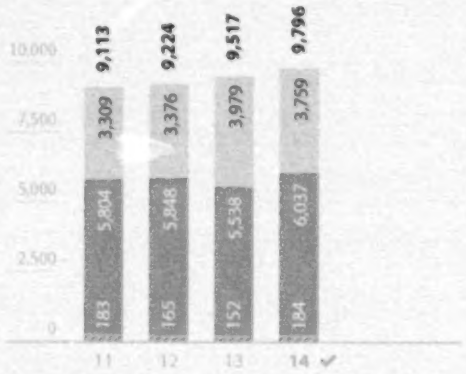
- The new meter installation project generated 831 complaints (320 in 2013). ✓
- The number of complaints about time on hold was down 49% (97 complaints in 2014). ✓
- The number of complaints related to responsibility for bill payment dropped 18% (379 complaints in 2014) following introduction of a new procedure for vacant units. ✓
- We received 37% fewer complaints about outages (122 complaints in 2014). ✓
- Claims fell 6% compared to 2013, largely because there were fewer weather events. Over half of the claims were for property damage and voltage fluctuations. ✓
- More than 50% of the appeals to the Régie de l'énergie involved the new meter installation project and billing. ✓

OVERALL CUSTOMER SATISFACTION INDEX
(scale of 10)



- Overall satisfaction index (excluding large-power customers)
- Target

CUSTOMER COMPLAINTS AND CLAIMS (number)



- Complaints
- Claims
- Appeals to the Régie de l'énergie

FAIRNESS FOR CUSTOMERS

To be fair to its customers, Hydro-Québec ensures that they each pay a reasonable amount for the services they receive. Disconnection for nonpayment is a last resort. From December 1 to March 31, service is maintained or restored to customers whose homes are heated with electricity and who have failed to pay their bills.

Every year, thousands of low-income customers who have difficulty paying their bills benefit from special long-term payment arrangements. In order to respond adequately to the needs of low-income customers, Hydro-Québec has simplified the personalized agreement process with a view to reaching more customers.

Other possible solutions facilitate identification of low-income customers so they can be offered appropriate services and programs to prevent them from incurring debt with Hydro-Québec. To facilitate business relations and the collection process with customers who do not have a good command of either French or English, Hydro-Québec deals with four non-profit organizations that provide translation services in 19 languages and guarantee that the information exchanged will remain strictly confidential.

Support for low-income customers

Hydro-Québec, assisted by the low-income households and local associations working group, has developed various products and services for low-income customers. Here are some initiatives intended to prevent further indebtedness:

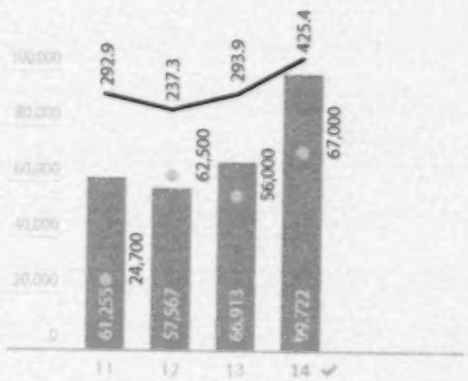
- Promotion of the Equalized Payments Plan (EPP) among all residential customers
- Offer of the EPP to customers who anticipate payment difficulties
- Two promotional campaigns: *Before you rent* and *Don't let the situation get worse*
- Faster, more frequent communications with customers in collections
- Work with intermediaries (consumer associations and others) so that they encourage customers to contact Hydro-Québec quickly about their financial situation and reach an agreement.

2014 HIGHLIGHTS

- Payment arrangements were signed with residential customers to facilitate 288,409 settlements totaling $683 million in arrears. ✓
- 99,722 long-term payment arrangements covering $425 million were reached with low-income customers; 37,408 of these agreements, amounting to $41 million, provided assistance with payment of arrears and, if necessary, partial payment of current electricity use. ✓
- The consumer associations' working group on collections held five meetings.
- 87 employees attended a workshop on doing business in a context of poverty.
- A presentation on collection practices was given to consumer association representatives to inform them about the payment agreement process for low-income customers who have difficulty paying their electricity bills and the available communication tools.

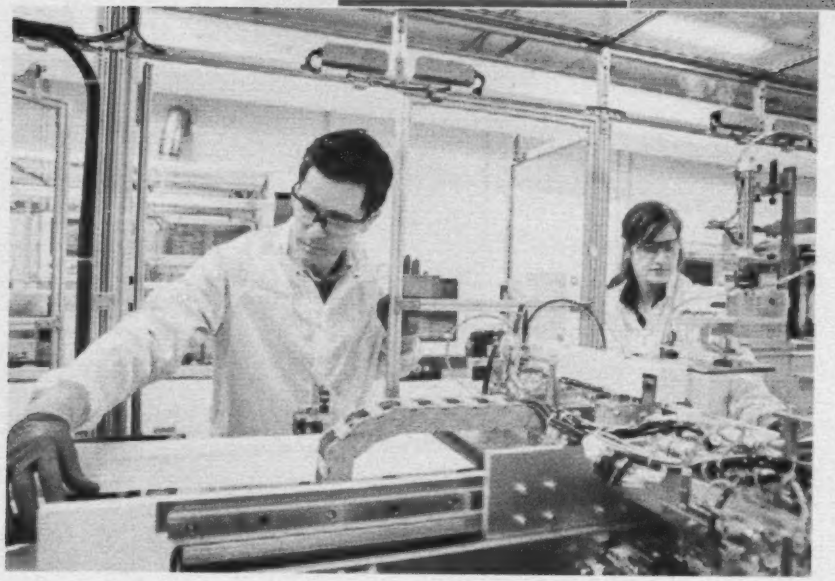
Even in extremely cold weather, system reliability and service quality are maintained.

PORTFOLIO OF COLLECTION SOLUTIONS: ARRANGEMENTS – LOW-INCOME HOUSEHOLDS[a]



a) Includes long-term arrangements.

TECHNOLOGICAL INNOVATION



In a dry room in IREQ's energy storage laboratory, expert technician Martin Dontigny and technician Catherine Gagnon use an automatic stacker to make large soft-pack lithium-ion batteries.

The Electric Circuit, Canada's first public charging network, covers almost all parts of Québec.

Our technological innovation projects have two major objectives: optimize the existing power system and extend its service life, and make the future grid smarter, more automated and more flexible in order to serve customers better. Much of our innovation is the work of Hydro-Québec's world-class research institute (IREQ), which is in the forefront of innovation in power generation, transmission and distribution, and customer service. With an annual budget of $100 million, IREQ partners with the company's business units. In addition, contributions are made to university chairs and the business units conduct R&D with companies, industry partners and other specialized research centres.[a]

Hydro-Québec's innovation projects focus on reliability and asset sustainment, energy efficiency and emerging renewable energies, as well as transportation electrification—more specifically, advanced battery materials, energy conversion and energy storage. Development of innovative practices and technologies results in cost avoidance, additional sales, productivity gains and investment deferral. IREQ's scientific breakthroughs, inventions and R&D also enhance the company's international reputation. Since IREQ was created, its staff members have obtained some 1,100 patents and published thousands of articles. Hydro-Québec also works with many international partners under 250 signed agreements.

a) For example, advancements in the various design stages for structures built by Hydro-Québec Équipement et services partagés (in engineering, hydraulics, geotechnics, geology and other fields) are not included in IREQ's budget.

EXCLUSIVE WEB CONTENT

- Transportation electrification
- Technological innovation
- Support for university chairs

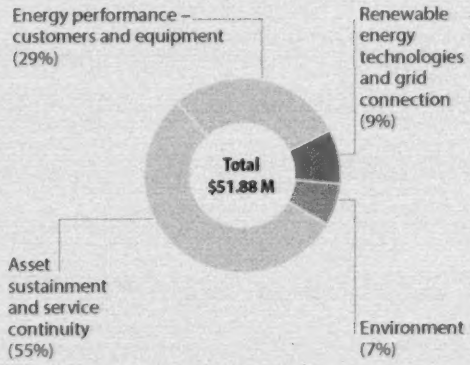
EXAMPLES OF SUSTAINABILITY-RELATED INNOVATION PROJECTS – 2014

CATEGORY	ACHIEVEMENT OR WORK IN PROGRESS	INVESTMENT ($'000)[a] ✓
Environment	▪ Optimization of operation, maintenance and long-term operability of oily water recovery systems in transmission substations, update of design criteria for these systems and use of new designs that perform better and are less costly. ▪ Search for more environmentally friendly lubricants for mechanical parts in generating facilities and development of new self-lubricating materials to eliminate lubricant use in some applications.	3,770
Asset sustainment and service continuity	▪ Optimization of facility design and management to extend service life and facilitate the decision to refurbish or replace assets. Simulation of aging mechanisms improves diagnostics and prediction of remaining service life.	28,647
Energy performance – customers and equipment	▪ Testing of two identical houses representative of Québec homes to identify new possibilities for energy savings and demand management. ▪ Demonstration project testing the use of semi-automated control strategies for heating, ventilation and air-conditioning in five commercial and institutional buildings during peak demand periods. Result: average power demand was reduced by 31% to 66% and occupant comfort was maintained. The project will continue in 2015 in 35 company buildings. The objective is to reduce power demand by 300 MW by 2020.	15,107
Renewable energy technologies and grid connection	▪ Technical and financial verification of the use of liquid biofuel to improve environmental performance and reduce operating costs in off-grid thermal generating stations. ▪ Development and assessment of low-cost (< 10¢/kWh) photovoltaic technologies and contribution to development of two promising Québec photovoltaic technologies. ▪ Ongoing investigation of geothermal potential in some parts of Québec: following examination of the potential in northern Québec, the work now deals mainly with assessment of geothermal reservoir performance and optimization of heat-electricity conversion cycles in the Québec climate.	4,356

a) Excludes investments in energy storage and conversion.

IREQ signed an agreement with the Regional Council of Aquitaine (France) relating to advanced battery materials for transportation electrification.

BREAKDOWN OF IREQ INNOVATION EFFORTS RELATED TO SUSTAINABILITY – 2014[a] ✓


Energy performance – customers and equipment (29%)
Renewable energy technologies and grid connection (9%)
Total $51.88 M
Asset sustainment and service continuity (55%)
Environment (7%)

a) Excludes investments in energy storage and conversion.

PARTNERSHIPS

When it comes to innovation, Hydro-Québec joins forces with universities, research organizations and industrial partners: this gives it complementary expertise and allows resources and risks to be shared. The company supports Québec universities with research contracts and funding for university chairs. It also works with the Ouranos Consortium on Regional Climatology and Adaptation to Climate Change.

Most of the chairs that Hydro-Québec supports are funded in equal measure by the National Sciences and Engineering Research Council of Canada (NSERC), increasing the universities' R&D capacity for projects of interest to the company.

2014 HIGHLIGHTS

- Hydro-Québec and Sony (Japan) launched a joint R&D venture, Technologies Esstalion, that will design and test large-capacity energy storage systems to meet demand during peak periods and help bring intermittent energy sources onto the grid. The joint venture will build on Hydro-Québec's power grid operation and control expertise, and the technologies it has developed in lithium-ion battery materials, as well as on Sony's highly scalable modular systems and its technology for manufacturing very safe, reliable olivine-type lithium-iron-phosphate rechargeable batteries.
- We continued to work with China Electric Power Research Institute and France's Réseau de transport d'électricité on real-time power system simulation using the Hypersim technology developed by IREQ.
- A 10-year licensing agreement was signed with the United Kingdom's National Grid Electricity Transmission to use LineScout, a remotely controlled robot designed by IREQ, to inspect high-voltage transmission lines: technology transfer has begun.
- TM4's SUMO powertrain was selected by two of China's largest bus manufacturers, Foton and BLK, which ordered several hundred from Prestolite E-Propulsion Systems, a joint venture of TM4 and Prestolite Electric (Beijing).
- SCE France, a new joint venture with the Regional Council of Aquitaine, will develop lithium-iron-phosphate batteries and conduct research into new charging technologies using advanced materials.

CONTRIBUTIONS, COMMITMENTS, RESEARCH CHAIR FUNDING AND RESEARCH CONTRACTS ($'000)

EDUCATIONAL INSTITUTION OR RESEARCH GROUP	2011	2012[a]	2013[b]	2014[c] ✓
Université de Montréal	323.1	315.8	996.3	982.9
HEC Montréal	0.0	25.0	25.0	25.0
Polytechnique Montréal	632.1	1,650.4	653.3	698.5
Université du Québec en Abitibi-Témiscamingue	51.0	65.0	65.1	1.6
Université du Québec à Chicoutimi	240.7	80.0	129.7	113.1
Université du Québec à Montréal	996.1	1,018.9	749.0	762.0
Université du Québec à Rimouski	100.0	240.0	270.0	175.0
Université du Québec à Trois-Rivières	222.0	277.5	306.4	62.3
École de technologie supérieure	379.3	496.0	496.0	1,173.0
Institut national de recherche scientifique	5.0	183.4	7.5	608.9
McGill University	1,210.0	1,076.5	1,442.0	1,012.8
Concordia University	600.0	481.0	812.0	769.0
Université Laval	844.1	1,265.3	1,414.7	1,239.6
Université de Sherbrooke	584.5	1,259.9	1,064.8	1,044.5
Ouranos, Cirano and Institute of Electrical Power Engineering	1,839.7	1,898.4	1,840.2	985.0
Institutions outside Québec	490.1	556.5	593.9	623.7
College technology transfer centres	not applicable	not applicable	195.2	159.5
Total	**8,517.7**	**10,889.6**	**11,061.1**	**10,436.4**

a) Includes $3.5 million recorded as donations and sponsorships.
b) Includes $3.2 million recorded as donations and sponsorships.
c) Includes $3.3 million recorded as donations and sponsorships. ✓

TRANSPORTATION ELECTRIFICATION

In Québec, transportation accounts for 42% of GHG emissions, the main cause of climate change. By innovating and mobilizing stakeholders, Hydro-Québec actively fights climate change. For example, it promotes transportation electrification, a Québec government priority.

The company has developed and implemented a four-part transportation electrification action plan that includes:

- Financial support for the development of electrical infrastructure for public transit
- Development and marketing of advanced technologies
- Test-driving of electric vehicles and experimenting with their integration into the power grid
- Installation of the support infrastructure for charging electric vehicles, the Electric Circuit.

For several years, Hydro-Québec has conducted projects to demonstrate the reliability and interest of rechargeable electric vehicles and has helped develop the technologies to make them a reality.

The Electric Circuit is Canada's first public charging network. By year-end it had 358 charging stations—eight of them fast-charging (400-V) stations—in 15 of Québec's 17 administrative regions. Its 92 member companies, institutions and municipalities participate by purchasing and installing charging stations. ✓

2014 HIGHLIGHTS

- Electric Circuit:
  - 39 new partners and 110 level 2 (240-V) and seven 400-V charging stations were added. ✓
  - The number of monthly charges by the overall network increased 193%.
  - In a partnership with Nissan, 25 fast-charging stations will be installed by the end of 2016 in the main ground transportation corridors and major urban centres.
- We collaborated on public transit electrification studies and projects with the Société de transport de Montréal, Société de transport de Laval, Réseau de transport de Longueuil, Réseau de transport de la Capitale and Société de transport de Lévis.
- The Clic carpooling project, where we are working with the Agence métropolitaine de transport and Société de transport de Laval, uses 10 Chevrolet Volt cars.
- Ten patents were filed for battery materials and 32 scientific articles were published.
- A test project on vehicle-to-grid (V2G) and vehicle-to-home (V2H) systems continued. The test vehicle is equipped with Québec technologies; the project's results will be known in 2015.

CHANGES IN QUÉBEC'S ELECTRIC CIRCUIT CHARGING NETWORK (number)

	2012[a]	2013	2014 ✓
Charging stations	138	241	358
Partners	23	53	92
Members	658	1,524	3,637
Administrative regions	10	14	15

a) Inaugurated on March 30, 2012.

LOCATION OF CHARGING STATIONS IN QUÉBEC

QUÉBEC SALES OF ELECTRIC VEHICLES

Electric vehicle sales in Québec doubled in one year to more than 5,000 vehicles by the end of 2014: this is nearly half of the electric vehicles sold in Canada. Numerous surveys show that a substantial percentage of the respondents say they are ready to consider such a purchase. At the beginning of 2013, a Canada-wide survey (in French only) showed that 42% of Quebecers might or would probably choose an all-electric vehicle for their next car purchase.

HEALTH AND SAFETY

Powerhouse mechanic Hugues Raby, chief powerhouse mechanic Michel Béland, civil engineering worker Jérémy Rancourt, safety advisor France Richer, civil engineering worker Yvan Amyot, and powerhouse mechanic Dominic Pilon check a rescue technique for work inside scrollcases as part of the safe lockout project.

A study carried out in collaboration with the Montreal Heart Institute showed that a person with a pacemaker can pass under high-voltage lines without any risk of interference.

The health and safety of its employees, customers and anyone likely to be near its facilities are important to Hydro-Québec. Since electricity use can be hazardous, the company informs the public of precautions that should always be taken. We also study the potential human health effects of our operations, in order to improve our understanding and take any necessary measures to mitigate risks and inconvenience.

HYDRO-QUÉBEC OPERATIONS AND HUMAN HEALTH

Live conductors and electrical equipment generate electric and magnetic fields (EMFs); extensive research has been done on their potential effects for over 35 years. Some electrical and electronic devices also emit radio frequencies.

Reservoir impoundment leads to the conversion and circulation, in the aquatic environment, of mercury already present in plants and flooded soil. The result is an increase in fish mercury levels, which return to normal after 10 to 35 years. This phenomenon is closely monitored and fish consumption recommendations are issued, as needed.

EXCLUSIVE WEB CONTENT

- Information on electric and magnetic fields
- *The Power System and Health – Electric and Magnetic Fields* brochure
- Next-generation meters
- Hydro-Québec and the mercury issue
- Safety near power lines
- Safety near hydropower facilities
- Employee health and safety

Although it is not exactly a health issue, noise from electrical facilities is a nuisance that Hydro-Québec endeavors to mitigate in sensitive areas like residential districts. The company installs quieter equipment during facility construction or upgrades. When reduction at source does not suffice, noise abatement measures are implemented whenever possible.

2014 HIGHLIGHTS

Electric and magnetic fields

- Scientific research was published on the neurophysiological effects of high-intensity magnetic fields on humans, especially the magnetophosphene perception threshold. This research was conducted in cooperation with Électricité de France and the Réseau de transport d'électricité (France), as well as the Electric Power Research Institute (United States), National Grid (United Kingdom) and Lawson Health Research Institute (Canada). For the first time, the phenomenon in humans was replicated in the laboratory. These studies aim to determine, in a large number of subjects, what EMF level is required to trigger the phenomenon in humans. The results will be used to update EMF exposure limits.
- A study of high-voltage transmission line interference with pacemakers and implantable cardioverter defibrillators, conducted in cooperation with the Montreal Heart Institute, was completed. The study results showed there is no interference between these devices and high-voltage lines.

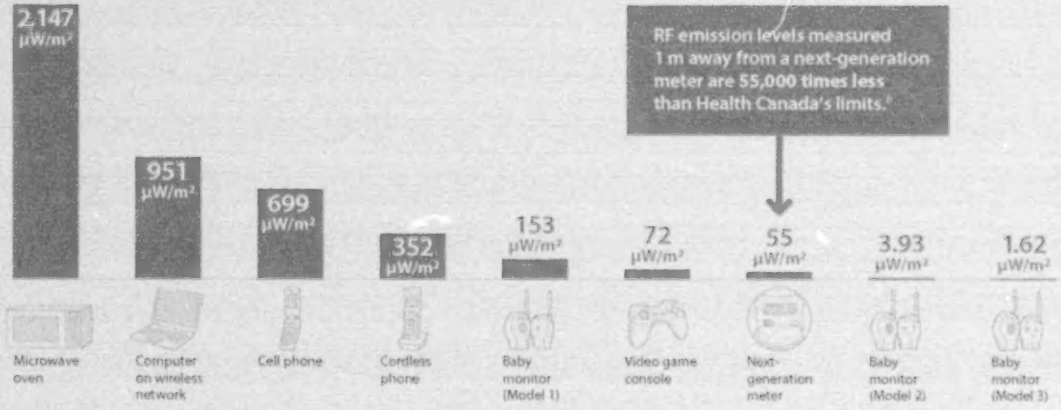
Radio frequencies

- A report published by the Royal Society of Canada looked at the potential health risks of radio-frequency emissions from such devices as cell phones, Internet routers and next-generation meters. The observations did not reveal any negative health impact from exposure below the limit recommended by Health Canada (2,700,000 μW/m²).

Mercury

- New fish consumption guides for Côte-Nord and Baie-James reservoirs (in French only) were distributed. The guides were produced in 2013 in conjunction with the Cree Board of Health and Social Services of James Bay, Centre régional de santé et de services sociaux de la Baie-James, North Shore Health and Social Services Agency and Institut national de santé publique.
- The fish consumption guide for Rivière Saint-Maurice water bodies (Haute-Mauricie) (in French only) was produced in conjunction with local public health organizations. Fish mercury levels were higher than forecast and consumption recommendations were reduced for some fish species.
- Two fish, seafood, wildlife and waterfowl nutrition guides were produced and distributed in the Innu community of Ekuanitshit in cooperation with the local health centre. These guides provide information about natural and current mercury levels in fish, seafood, animals and waterfowl in the Romaine area and on the health benefits of these foods.
- The Northern Fish Nutrition Guide – Baie-James Region was produced in both North Cree and South Cree dialects in cooperation with local public health organizations.

MEAN POWER DENSITY MEASURED NEAR COMMON HOUSEHOLD DEVICES
Tests by the Centre de recherche industrielle du Québec (CRIQ)[a]



a) Source: For details on the measurement protocol used to obtain these values, see *Rapport d'essais de compatibilité électromagnétique, Mesures comparatives des compteurs avancés*, CRIQ file 670-43736-5.

b) Limit recommended by Health Canada: 2,700,000 μW/m².

Noise

- Noise at De Lorimier substation was reduced by installing sound barriers and replacing the cooling fans on a transformer.
- The prototype for a sound-barrier cover was developed with a view to reducing noise from power transformers.

FACILITY SECURITY AND PUBLIC SAFETY

Hydro-Québec monitors its facilities closely and warns the public about hazards that exist near electrical and hydropower facilities. The company conducts awareness campaigns to promote caution and safe use of electricity.

2014 HIGHLIGHTS

- The first meeting was held of a subcommittee of representatives from Hydro-Québec and the Cree Nation of Chisasibi to update the emergency measures plan for dam safety at the La Grande complex.
- As part of a security awareness campaign, the toll-free number used to report risks to personal safety or company assets received 2,816 calls ✓ (2,730 in 2013). The number of calls increased because of the excellent support provided by employees and the public for the company's security efforts.
- A Power Safety section was added to Hydro-Québec's Web site.
- Cottagers and visitors were made aware of the hazards near hydropower facilities in Mauricie. During its second summer of operation, the safety patrol kept 365 people away from hazardous sites.

HYDRO-QUÉBEC OPERATIONS AND HUMAN HEALTH

ISSUE	RESEARCH STATUS	CONCLUSION
Health effects of EMFs generated by live conductors and electrical equipment	For 40 years, hundreds of epidemiological studies and tests have been conducted. The opinion of some large organizations is available in the brochure entitled *The Power System and Health – Electric and Magnetic Fields*.	To date, no EMF-related health effects have been found but Hydro-Québec is committed to remaining vigilant. Corporate position on EMFs. Public health authorities (in French only) have reached similar conclusions.
Health effects of radio frequencies emitted by next-generation meters	Recent research and opinions: Royal Society of Canada, Health Canada, Ministère de la Santé et des Services sociaux (in French only).	Radio frequencies emitted by the new meters are not hazardous to health. The average exposure level to radio frequencies 1 m away from these meters is 55,000 times less than the limit set by Health Canada and is negligible compared to radio-frequency exposure from other common household devices.
Health effects of the temporary increase in fish mercury levels after reservoir impoundment	From the early 1980s until about 2012, Hydro-Québec conducted an extensive research program in conjunction with a number of partners.	Mercury levels in developed environments are not harmful to fish-eating fish, birds or mammals. However, public health agencies must make sure that anglers do not exceed the mercury exposure level deemed safe for their health.
Health effects of noise from transmission lines and substations	Issue not well documented. The matter of public sensitivity to substation noise is rarely discussed. Noise is not spontaneously associated with lines and is not often recognized as a nuisance in the literature.	Noise generated by lines and substations cannot cause clinical health problems or hearing loss because the noise levels in question are relatively low. Similarly, we cannot conclude that the noise has a significant effect on the health, activities or behavior of residents living near our facilities, although it may constitute a nuisance for some people (sleep, stress, etc.).

EMPLOYEE HEALTH AND SAFETY

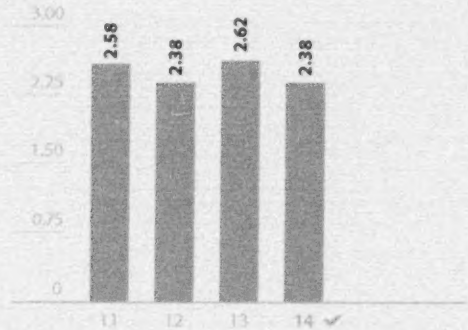
Whether in R&D, training, monitoring or field operations, Hydro-Québec considers workers' health and safety to be of prime importance.

2014 HIGHLIGHTS

- Occupational health and safety training: 18,002 registrations (17,935 in 2013). ✔
- Number of participants in health awareness and promotion activities: 6,799 (7,080 in 2013). ✔
- The sixth update of the company's Work Safety Code sets out the safety rules to follow at all times, as well as a training plan for some 12,000 workers, including subcontractors' employees.
- The first phase was completed of the project to maximize attendance at work by improving management practices: days of absence were reduced by 4%.

Every year, Hydro-Québec reminds the general public about the hazards of pruning trees near power lines, often through ads published in print media.

WORK-RELATED ACCIDENT FREQUENCY[a]



a) Per 200,000 hours worked.

ELECTRICAL ACCIDENTS – 2014

	INCIDENTS ✔	DEATHS ✔
Public – Hydro-Québec facilities	10	2
Public – use of electricity	0	0
Skilled workers – Hydro-Québec facilities	23	1
Skilled workers – use of electricity	4	0
Hydro-Québec employees	134	0
Total	**171**	**3**

Public. Tree pruning and trimming were involved in 41% of the incidents reported, which included two fatalities. The causes: contact between a conductor and a tool, and an electrical shock received while climbing a Hydro-Québec pole. ✔

Skilled workers. Tool handling or aerial work near the Hydro-Québec system caused 53% of the events reported, including a fatal accident of a skilled worker. The cause: contact with a conductor while moving a ladder. ✔

HUMAN RESOURCES

At Carillon generating station in the Laurentides, civil engineering worker Nathalie Grenon, environment advisor Robin Poirier, civil engineer Pascal Pfendler, maintenance manager Francis Bernard and project coordinator Pierre Tardif work together.

With 20,043 employees ✔ working in nearly 150 locations throughout Québec, Hydro-Québec is one of the province's major employers. The company fosters a healthy, motivating workplace that encourages employees to give their best and contribute to the company's success.

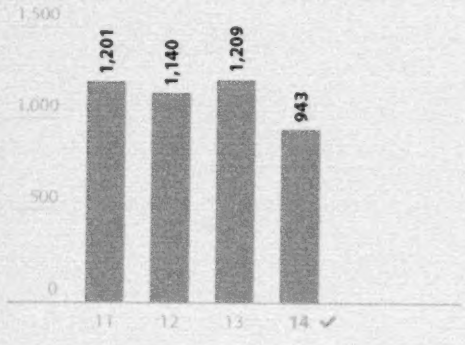
SUCCESSION AND EMPLOYEE ENGAGEMENT

Since 2011, 4,493 employees ✔ have retired and Hydro-Québec has taken the necessary steps to preserve and renew essential know-how in management and core businesses.

Work organization, support structures and definition of responsibilities are keys to good performance by employees and the company. In recent years, a number of projects have improved the company's efficiency, resulting in organizational and work process restructuring. To limit the repercussions, Hydro-Québec has put substantial effort into reassigning people who have lost their jobs.

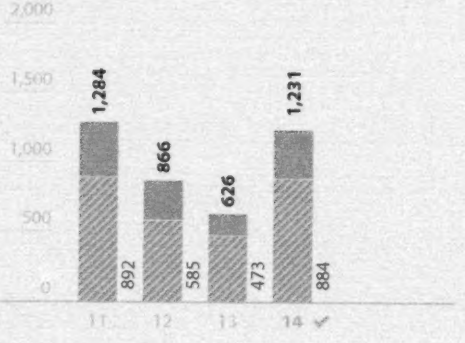
In the current business climate, managers need skill in sharing the company's vision and business concerns to achieve sustainable performance for the coming years. To support managers, a leadership development program is available for supervisory and middle managers, whether they are novices or experienced. Executive mentoring is also part of the training, as well as induction and development to meet managers'

RETIREMENTS (number)



■ Retirements

NEW EMPLOYEES RECRUITED (number)



■ New employees recruited
▨ New employees under age 35

specific needs. Since 2010, 740 managers—584 supervisory managers and 156 middle managers—have completed the program.

2014 HIGHLIGHTS

- As a founding partner of the Institute of Electrical Power Engineering (IEPE) (in French only), Hydro-Québec awarded 15 Jean-Jacques-Archambault academic scholarships and 37 traveling scholarships to IEPE students, for a total value of $75,300. Since the Institute was established in 2001, 192 graduates have joined the company's ranks, including 15 in 2014. ✓
- In the wake of the 2013 renewal of several collective agreements with Hydro-Québec employees, 84.5% ✓ of whom are unionized, an agreement was signed with the Syndicat des technologues in February 2015 that will remain in effect until 2018.
- According to an employee survey, the overall employee engagement index was 62%. ✓ An awareness campaign to promote a healthy and stimulating work environment continued.
- More than 3,400 employees were informed about harassment prevention and the behaviors encouraged in a healthy, stimulating work environment. ✓ A dedicated information and complaints handling service for employees was promoted; it is available by telephone or email.

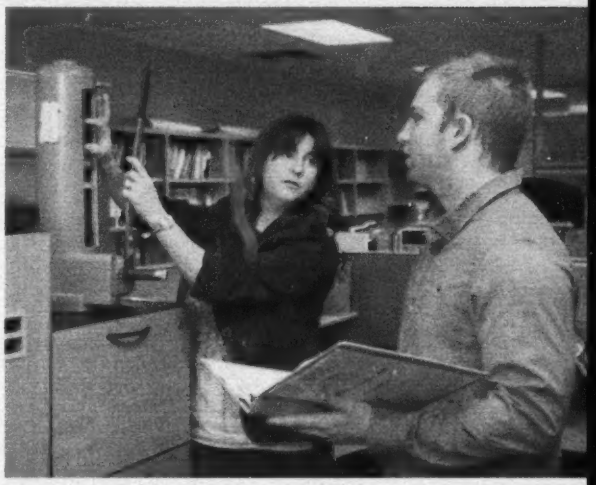
HYDRO-QUÉBEC WORKFORCE

	2011	2012	2013	2014 ✓
Permanent workforce (number)	19,415	18,926	17,861	17,793
Temporary workforce (number)	3,086	2,670	2,382	2,250
Average age	45.2	45.5	45.6	45.5
Target group representation (%)				
Women	31.1	30.6	30.0	29.4
Aboriginals	0.8	0.9	1.0	1.0
Ethnic minorities	1.3	1.4	1.4	1.4
Visible minorities	3.0	3.1	3.2	3.5
People with disabilities	1.1	1.1	1.0	0.9

INTERNSHIPS (number)

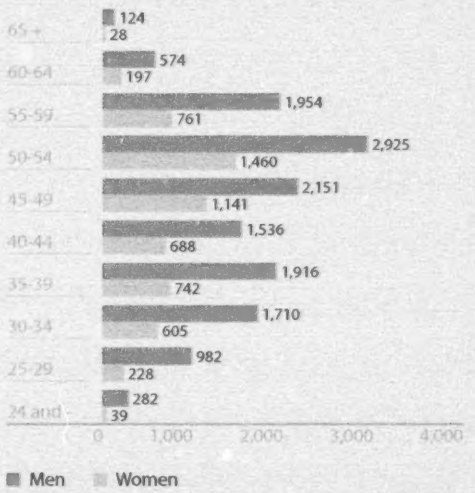
	2011	2012	2013	2014 ✓
University internships (excluding IEPE)	303	268	227	273
IEPE internships	22	18	16	17
College internships	51	39	32	40
Total	**376**	**325**	**275**	**330**

In the past four years, the company arranged 1,306 internships.



Engineer Lyne Brisson explains the operation of a circuit breaker's interruption chamber to intern Simon Gohier-Saint-Jean.

EMPLOYEE AGE PYRAMID – 2014 (number) ✓



INVESTING IN THE COMMUNITY

Young visitors at the Électrium, Hydro-Québec's electricity interpretation centre in Varennes (Montérégie).

Our community investments help improve the quality of life in the communities in which we operate. The company has a presence throughout the province, so Québec as a whole benefited from the $30 million invested in 2014.

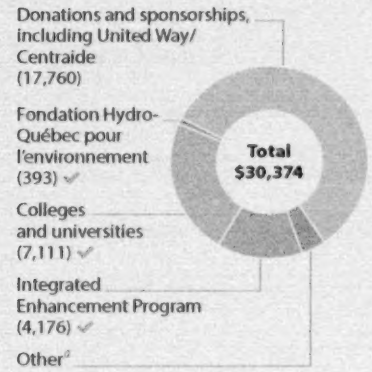
DONATIONS AND SPONSORSHIPS

Every year, Hydro-Québec devotes part of its average net income to donations and sponsorships. In order to choose between the many requests it receives, the company bases decisions on its Donation and Sponsorship Policy and fair selection criteria that reflect its values. With sustainability in mind, it encourages projects that support its role as a corporate citizen, maintain or improve community relations, or promote its strategic objectives, programs and services.

2014 HIGHLIGHTS

- Donations and sponsorships amounted to $17.8 million: the $2.0 million ✓ for United Way/Centraide was added to the $2.1 million ✓ raised by employees and pensioners. Hydro-Québec is one of the province's major corporate donors to United Way/Centraide.
- A $140,000 sponsorship was granted to *Culture pour tous* to organize Les Journées de la culture (Culture Days), an event held in over 350 Québec communities to raise public awareness of the importance and need for greater access to arts and culture. ✓

COMMUNITY INVESTMENTS – 2014 ($'000)


Donations and sponsorships, including United Way/ Centraide (17,760)
Fondation Hydro-Québec pour l'environnement (393) ✓
Colleges and universities (7,111) ✓
Integrated Enhancement Program (4,176) ✓
Other[a] (934)
Total $30,374

a) The Other category includes Youth Products ($719,000), the art collection ($200,000) and presentations at universities and colleges ($15,000). Contributions to institutions of higher education are shown on page 58.

EXCLUSIVE WEB CONTENT

- Donations and sponsorships
- Integrated Enhancement Program
- Fondation Hydro-Québec pour l'environnement
- Youth awareness
- Hydro-Québec art collection
- Industrial tourism
- International influence and cooperation
- Guest speakers from experts Hydro-Québec – Invite a guest speaker from Hydro-Québec!

During the summer, community organizations in Saguenay–Lac-Saint-Jean saw the creation of the very first educational urban garden in the yard of Hydro-Québec's regional administrative centre. This employee initiative produced a harvest that benefited poor families in the community.

FUNDING AND FINANCIAL COMMITMENTS – INTEGRATED ENHANCEMENT PROGRAM

	2011	2012[a]	2013	2014
Number of initiatives	45	41	26	53 ✓
Hydro-Québec funding ($'000)	2,262.6	3,492.4	2,798.9	4,176.0 ✓
Community funding ($'000)	4,395.9	6,396.5	4,547.8	22,284.6
Project value ($'000)	6,658.5	9,888.9	7,346.7	26,460.6

a) 2012 data has been restated to reflect two agreements signed in 2012 but recorded in 2014 (five projects totaling $997,600).

Hydro-Québec's annual funding varies depending on the number and size of transmission projects in progress.

- A $75,000 sponsorship went to the Canadian Red Cross, Québec Division, to support its mission to improve the lives of vulnerable people by mobilizing the power of humanity in Canada and around the world. ✓

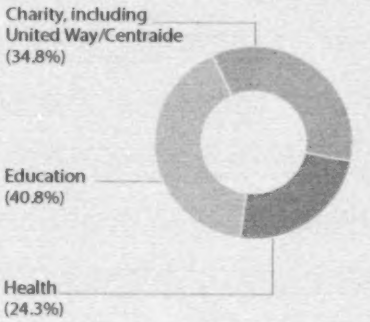
INTEGRATED ENHANCEMENT PROGRAM

To offset the residual impacts of its transmission projects, especially on the landscape, Hydro-Québec's Integrated Enhancement Program (IEP) (in French only) allocates 1% of the value initially authorized for its infrastructure projects to communities where the lines or substations are located. The funds are used for local initiatives that enhance the environment or improve municipal, community or recreational infrastructure, or for regional, tourist or Aboriginal community development. Since the IEP was created in 1985, Hydro-Québec has disbursed $121 million for a total of 1,226 initiatives.

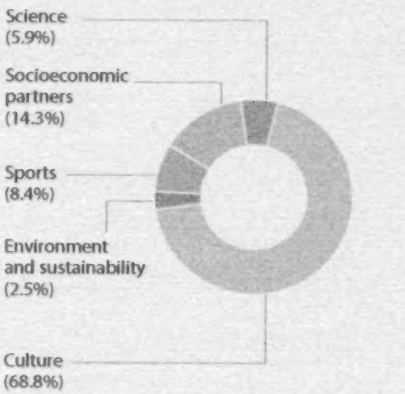
2014 HIGHLIGHTS

- Construction of Outardes substation and 735-kV lines: eight municipalities shared $927,300. The city of Baie-Comeau received $200,008 to develop a 3.3-km bicycle trail north of Boulevard Laflèche in the Hydro-Québec transmission line right-of-way. (Côte-Nord) ✓
- Construction of the 230-kV Rimouski–Les Boules line: the municipality of Sainte-Luce received $98,749 to refurbish buildings and the L'Anse-aux-Coques esplanade that were damaged by tides. This money was used to make the paved walk more solid and safer for the many summer visitors. Street furniture was also added at the Halte luçoise rest stop. (Bas-Saint-Laurent) ✓

BREAKDOWN OF DONATIONS – 2014



BREAKDOWN OF SPONSORSHIPS[a] – 2014



a) Excludes funding by the Fondation Hydro-Québec pour l'environnement.

GRI G4-22

FONDATION HYDRO-QUÉBEC POUR L'ENVIRONNEMENT

Established in 2001, the Fondation Hydro-Québec pour l'environnement supports the improvement and long-term protection of the environment. It helps honor the company's commitments relating to sustainability and responsible resource management. It funds initiatives whose environmental and social benefits serve community interests in local communities across Québec. The projects it supports aim to protect, restore and enhance natural environments, and educate target publics about local environmental issues.

2014 HIGHLIGHTS

- Funding of $60,000 was granted to the Bassin Versant Saint-Maurice group to provide user guidance and enhance the Saint-Maurice watershed between Grand-Mère and La Tuque. The group has a number of joint projects to protect many valuable riparian and insular wetlands that are likely to be threatened or made fragile by increased boat traffic on the river. The projects include production of a guide on good boating practices and respect for other users, installation of educational panels and signage, as well as on-site awareness activities. (Mauricie) ✓
- Funding of $25,000 was granted to the Société de conservation des Îles-de-la-Madeleine to develop and enhance Parc des Sillons. This initiative will channel all-terrain-vehicle traffic and build infrastructure (observation platforms and interpretation panels) to encourage hiking and bird-watching in the Sillons area of Havre-aux-Maisons. The creation of interpretation and awareness tools for students will also improve user knowledge of the islands' natural environments, biodiversity, the interaction between species and their habitats, and the role of buffer zones in protecting areas of high environmental importance. (Gaspésie–Îles-de-la-Madeleine) ✓

COMMITMENTS – FONDATION HYDRO-QUÉBEC POUR L'ENVIRONNEMENT

	2011	2012	2013	2014 ✓
Projects supported	17	17	16	12
Regions involved	11	12	7	7
Amount granted ($'000)	556	757	760	393

Funding by the Fondation Hydro-Québec pour l'environnement varies annually depending on the number, quality and scope of the projects received.

Dominic Marchand, Advisor – Environmental Performance, IEP Coordinator, Hydro-Québec

IEP – 30 YEARS IN COMMUNITIES

The IEP is a unique program created 30 years ago by Hydro-Québec. Its objective is to offset the residual impacts of new transmission facilities (lines and substations). The video shows projects completed by two municipalities in 2014.

In Saint-Bruno-de-Montarville, Parc Marie-Victorin was transformed by developing a beach volleyball court, planting trees and shrubs, installing benches, picnic tables and bicycle racks, and adding new lawns and concrete walkways.

In Pont-Rouge, walking trails were developed along the Jacques-Cartier between the Déry house and Marcoux mill, two heritage buildings that were refurbished in 1995 initiatives and have cultural importance for the town.

OUR RESULTS

70 Our Performance at a Glance

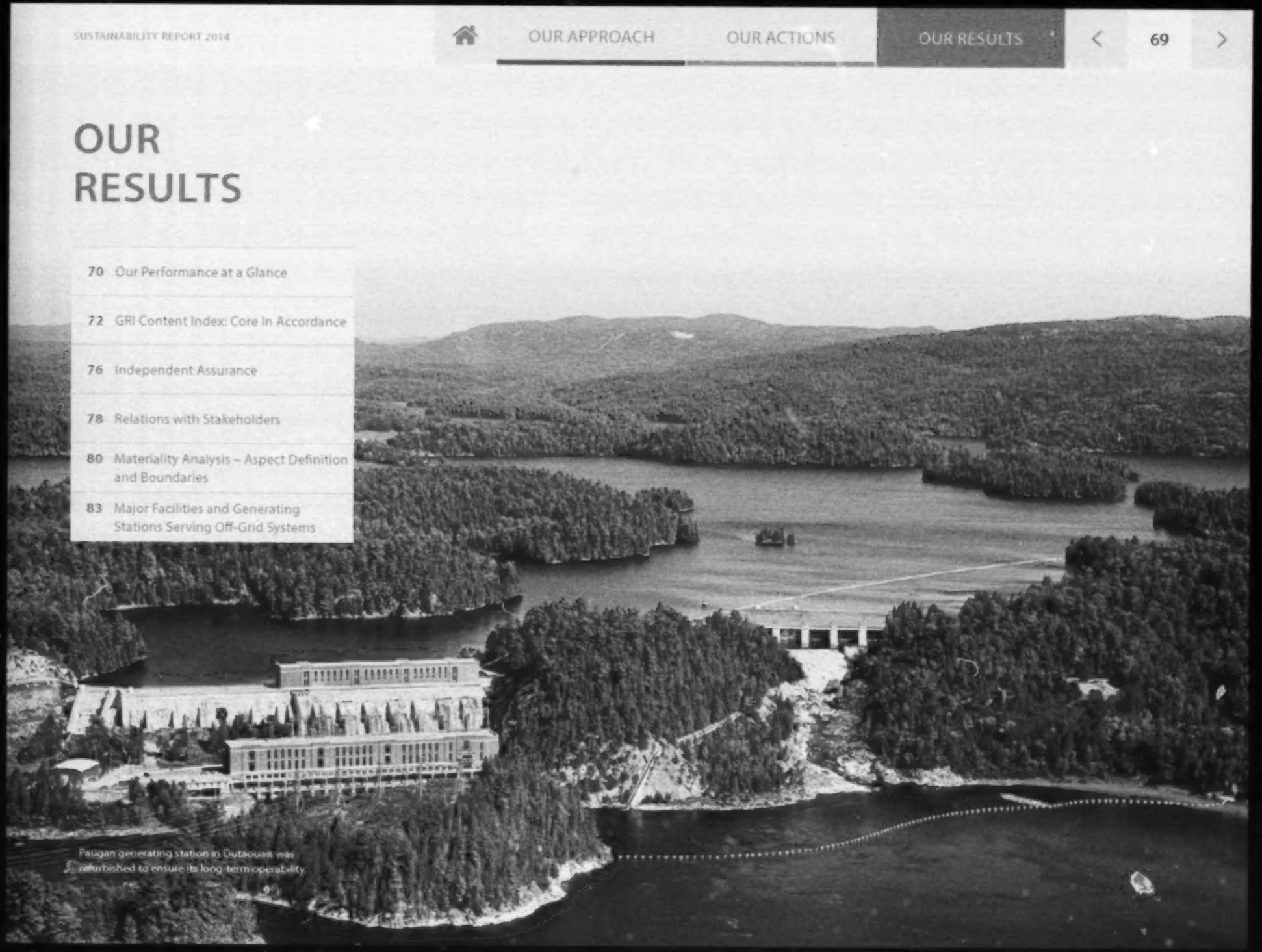
72 GRI Content Index: Core In Accordance

76 Independent Assurance

78 Relations with Stakeholders

80 Materiality Analysis – Aspect Definition and Boundaries

83 Major Facilities and Generating Stations Serving Off-Grid Systems



Paugan generating station in Outaouais was refurbished to ensure its long-term operability.

OUR PERFORMANCE AT A GLANCE

	2011	2012	2013	2014
ENVIRONMENT				
Net electricity generated by Hydro-Québec (GWh)	169,017	171,442	178,150	172,981 ✓
Total net electricity generated and purchased (GWh)	208,742	214,062	220,147	216,703 ✓
Renewable energy/total energy generated and purchased (%)	97	98	99	99 ✓
GHG emissions from thermal electricity generation (t CO_2 eq.)	215,036	215,325	220,098	228,353 ✓
SO_2 emissions from thermal electricity generation (t)	1,423	1,240	1,147	1,092 ✓
NO_x emissions from thermal electricity generation (t)	6,256	6,250	4,096	4,243 ✓
GHG emissions from the vehicle fleet (t CO_2 eq.)/total number of vehicles as at December 31[a]	57,296/5,497	52,064/5,370	51,831/5,376	50,562/5,392 ✓
Energy Efficiency Plan: energy savings (result/target) (GWh)[b]	1,007/648	1,040/693	613/553	504 ✓/464
Employees governed by an environmental management system (number)[c]	19,124	18,414	17,146	17,036 ✓
Environmental non-compliance notices (number)	30	31	38	37 ✓
Spills reported to the authorities (number)[d]/spills fully recovered (%)	762/80	830/72	999/74	897/77 ✓
Insulating oil recovered (thousands of litres)/reuse (%)	2,608/88.8	3,340/80.1	4,169/81.2	4,812/92.2 ✓
Water withdrawn (millions of m^3)[e]	710	756	531	300 ✓
Area of transmission line rights-of-way treated mechanically (%)	78	97	99	99 ✓
Area of dikes and dams treated mechanically (%)	62	46	58	68 ✓
Percentage of distribution lines underground	10.6	10.9	10.9	11.0 ✓

a) Data restated as a result of adoption of a new calculation method.

b) Excludes projects of the Québec government's Bureau de l'efficacité et de l'innovation énergétiques and the CATVAR project. Adjustments may have been made following program evaluation.

c) Decrease is attributable to workforce reduction. The percentage of employees governed by an environmental management system remained stable at 85%.

d) The 2013 increase is mainly attributable to increased monitoring of contractor activities on construction sites.

e) According to the *Regulation respecting the declaration of water withdrawals* which applies to thermal generating stations and some workcamps using more than 75 m^3 of water per day (excludes withdrawals for PRG Canada).

OUR PERFORMANCE AT A GLANCE (continued)

	2011	2012	2013	2014
SOCIAL				
Public satisfaction (very and somewhat satisfied) (%)	93	92	91	87
Funding and financial commitments – Integrated Enhancement Program ($M)/ number of initiatives	2.3/45	2.5/36	2.8/26	4.2/53 ✓
Fondation Hydro-Québec pour l'environnement ($'000)/number of projects funded	556/17	757/17	760/16	393/12 ✓
Donations and sponsorships ($M)[f]	18.0	17.7	18.6	17.8
Overall customer satisfaction index – other than Large-Power Customers (scale of 10)	7.5	7.5	7.5	7.5 ✓
System average interruption duration index (SAIDI) (minutes/customer)	163	150	165	143 ✓
Special payment arrangements for low-income customers (number)	61,255	57,567	66,913	99,722 ✓
Customer complaints and claims (number)	9,113	9,224	9,517	9,796 ✓
Total permanent and temporary workforce as at December 31	22,501	21,596	20,243	20,043 ✓
Employee engagement index (%)	73	69	61	62 ✓
Work-related accident frequency (per 200,000 hours worked)	2.58	2.38	2.62	2.38 ✓
Percentage of payroll invested in training	3.7	3.4	2.8	3.0 ✓
ECONOMY				
Electricity sales in Quebec (TWh)[g, h]	170.0	168.4	173.3	174.9
Revenue from electricity sales inside and outside Québec ($M)[g, h]	11,972	11,636	12,610	13,184
Net result ($M)[g]	2,611	860	2,942	3,380
Dividend ($M)[g]	1,958	645	2,207	2,535
Water-power royalties ($M)[g]	598	621	674	661
Total procurement of goods and services ($M)/Quebec only (%)[g]	2,913/93	3,011/94	3,533/95	3,301/94
Public utilities tax ($M)[g]	244	252	245	252
Municipal and school taxes ($M)[g]	35	36	36	37
Funding for educational institutions – contributions, commitments, research chair funding and research contracts ($M)[i]	8.5	10.9	11.1	10.4 ✓

f) Includes Hydro-Québec's donation to United Way/ Centraide.

g) 2014 data extracted from Hydro-Québec's Annual Report.

h) Data from continuing operations.

i) 2014 figure includes $3.3 million recorded as donations and sponsorships. ✓

GRI CONTENT INDEX: CORE IN ACCORDANCE[a]

GENERAL STANDARD DISCLOSURES

N°	GENERAL STANDARD DISCLOSURES	PAGE[b]	OMISSION	EXTERNAL ASSURANCE
STRATEGY AND ANALYSIS				
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ORGANIZATIONAL PROFILE				
G4-3	Name of the organization	1		✓ p. 76
G4-4	Primary brands, products, and services	2		✓ p. 76
G4-5	Location of the organization's headquarters	Web		
G4-6	Countries where the organization operates	83		✓ p. 76
G4-7	Nature of ownership and legal form	Web		
G4-8	Markets served	11, 83		✓ p. 76
G4-9	Scale of the organization	10, 35, 64–65, 71		✓ p. 76
G4-10	Workforce distribution	64–65		✓ p. 76
G4-11	Collective bargaining agreements	65		✓ p. 76
G4-12	Supply chain	14		✓ p. 76
G4-13	Significant changes	Web		
G4-14	Precautionary principle	61–62		✓ p. 76
G4-15	Charters, principles and other initiatives	6, 13–14, 25		✓ p. 76
G4-16	Memberships of associations	Web		
IDENTIFIED MATERIAL ASPECTS AND BOUNDARIES				
G4-17	Entities included	6, 10		✓ p. 76
G4-18	Report content and Aspect Boundaries	7–9		✓ p. 76
G4-19	Material Aspects	7–9		✓ p. 76
G4-20	Internal Aspect materiality	7–9, 80–82		✓ p. 76
G4-21	External Aspect materiality	7–9, 80–82		✓ p. 76

a) More information is provided in the Global Reporting Initiative (GRI) index on the Hydro-Québec Web site.

b) When a general standard disclosure is dealt with only on the Web site, the word Web is listed.

MATERIALITY DISCLOSURES SERVICE APR 2015 HYDRO QUÉBEC

GRI CONTENT INDEX: CORE IN ACCORDANCE (continued)

N°	GENERAL STANDARD DISCLOSURES	PAGE[b]	OMISSION	EXTERNAL ASSURANCE
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G4-23	Significant changes	7–9		✔ p. 76
STAKEHOLDER ENGAGEMENT				
G4-24	List of stakeholder groups	78–79		✔ p. 76
G4-25	Identification and selection of stakeholders	7		✔ p. 76
G4-26	Stakeholder engagement	7–8, 78–79		✔ p. 76
G4-27	Key topics and concerns	8		✔ p. 76
REPORT PROFILE				
G4-28	Reporting period	6		✔ p. 76
G4-29	Date of most recent previous report	Web		
G4-30	Reporting cycle	6		✔ p. 76
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GOVERNANCE				
G4-34	Governance structure	13–15		✔ p. 76
ETHICS AND INTEGRITY				
G4-56	Ethical behavior	14–15, 80		✔ p. 76
ELECTRIC UTILITY SECTOR DISCLOSURES				
EU-1	Installed capacity	35		✔ p. 76
EU-2	Net energy output	35		✔ p. 76
EU-3	Number of customer accounts	10		✔ p. 76
EU-4	Length of transmission and distribution lines	10–11, 70		✔ p. 76
EU-5	Allocation of CO_2 eq. emissions allowances	21–23		✔ p. 76

b) When a general standard disclosure is dealt with only on the Web site, the word Web is listed.

GRI CONTENT INDEX: CORE IN ACCORDANCE (continued)

SPECIFIC STANDARD DISCLOSURES

N°	MANAGEMENT APPROACH AND INDICATORS	PAGE	OMISSION	EXTERNAL ASSURANCE
ECONOMIC				
Aspect: Economic Performance				
G4-EC1	Direct economic value generated and distributed	50, 66–67	Salaries and employee benefits are not published and are considered confidential information.	✓ p. 76
G4-EC2	Climate change	4–5, 21–23, 24, 59, 70		✓ p. 76
Aspect: Indirect Economic Impacts				
G4-EC7	Infrastructure investments for local communities	37–43, 67–68		✓ p. 76
G4-EC8	Indirect economic impacts	37–43, 50, 55, 71		✓ p. 76
Aspect: Procurement Practices				
G4-EC9	Local suppliers	38–39, 41, 50		✓ p. 76
Aspect: Availability and Reliability (Electric Utilities Sector Disclosures)				
EU10	Planned capacity against projected electricity demand over the long term	32		✓ p. 76
ENVIRONMENT				
Aspect: Materials				
G4-EN1	Materials used	26	Hydro-Québec does not measure the weight or volume of raw materials used.	✓ p. 76
Aspect: Energy				
G4-EN6	Reduction of energy consumption	16–17, 30		✓ p. 76
Aspect: Water				
G4-EN8	Total water withdrawal by source	70		✓ p. 76
Aspect: Biodiversity				
G4-EN11	Sites near areas of high biodiversity value	24–25, 37–46		✓ p. 76
Aspect: Emissions				
G4-EN15	Direct greenhouse gas (GHG) emissions (Scope 1)	22, 70		✓ p. 76
G4-EN16	Indirect greenhouse gas (GHG) emissions (Scope 2)	22, 70		✓ p. 76
G4-EN18	Greenhouse gas (GHG) emissions intensity	22, 35		✓ p. 76

GRI CONTENT INDEX: CORE IN ACCORDANCE (continued)

N°	MANAGEMENT APPROACH AND INDICATORS	PAGE	OMISSION	EXTERNAL ASSURANCE
G4-EN19	Reduction of greenhouse gas (GHG) emissions	17		✓ p. 76
G4-EN21	NO_x, SO_x and other air emissions	22, 70		✓ p. 76
Aspect: Effluents and Waste				
G4-EN24	Total number and volume of significant spills	25, 70		✓ p. 76
Aspect: Products and Services				
G4-EN27	Extent of impact mitigation	16–19, 24–26		✓ p. 76
Aspect: Transport				
G4-EN30	Environmental impacts related to transportation	17–18, 22		✓ p. 76
SOCIAL – LABOR PRACTICES AND DECENT WORK				
Aspect: Occupational Health and Safety				
G4-LA6	Work-related accidents, diseases and absenteeism	63	Hydro-Québec discloses only the work-related accident rate. Other information for this indicator is confidential.	✓ p. 76
Aspect: Diversity and Equal Opportunity				
G4-LA12	Diversity and equality	64–65		✓ p. 76
SOCIAL – SOCIETY				
Aspect: Local Communities				
G4-SO1	Participation, assessments and development programs	47–49	The percentage is not available.	✓ p. 76
G4-SO2	Impacts on local communities	37–46		✓ p. 76
SOCIAL – PRODUCT RESPONSIBILITY				
Aspect: Customer Health and Safety				
EU25	Injuries and fatalities	63	Information about court decisions, out-of-court settlements and ongoing suits related to disease cases is not available.	✓ p. 76
Aspect: Product and Service Labeling				
G4-PR3	Product and service information	60–62		✓ p. 76
G4-PR5	Surveys measuring customer satisfaction	54		✓ p. 76
Aspect: Access (Electric Utilities Sector Disclosures)				
EU29	Average power outage duration	53, 71		✓ p. 76

INDEPENDENT ASSURANCE

To Hydro-Québec Management

The Bureau de normalisation du Québec has been engaged to conduct an independent evaluation of Hydro-Québec's *Sustainability Report 2014*, which covers the period from January 1 to December 31, 2014. The Report preparation and content are the responsibility of Hydro-Québec. Our role consists in providing an independent opinion of this Report.

LEVEL OF ASSURANCE AND BASIS FOR OUR OPINION

Our work meets the requirements of Type 2 assurance as provided in the *AccountAbility AA1000 Assurance Standard* (2008). Our evaluation focused on the systems, processes and quantitative data to achieve a moderate level of assurance. It consisted in reviewing the following qualities of the Report:

- Extent of adherence to the Principles for Sustainable Development in the *AA1000 AccountAbility Principles Standard* (2008)
- Concordance of Hydro-Québec's performance data with targeted indicators drawn from the GRI G4 standard disclosures.
- Reliability of the quantitative sustainability performance information (identified in the Report by the ✓ symbol).

ASSURANCE TEAM

The assurance team for the Report was composed of professionals and included specialists in measurement of environmental, social and economic aspects in various sectors. The team members confirm that they are independent.

ASSURANCE APPROACH

The assurance evaluation, conducted between January and March 2015, was based on the information collected and consisted of:

- Review of the main risks and issues in the industry
- Review of the sustainability-related strategies, policies, objectives, management systems and measurement and reporting procedures used by Hydro-Québec
- Interviews with managers in order to understand how Hydro-Québec deals with the key challenges of sustainability and how the concept of sustainability is implemented in the company
- Interviews with over 50 staff members to learn, among other things, what measures are implemented to facilitate dialogue with stakeholders and to understand the processes for collecting and presenting information about sustainability performance
- Review of the Report for any anomalies, particularly with regard to the information collected, and the trends perceived in the data
- Verification of over 300 data items selected from the Report by Hydro-Québec and examination of data processing procedures
- Collection and evaluation of evidence supporting the data
- Examination of the company's performance data to confirm that it concords with targeted indicators drawn from the standard disclosures in the GRI G4 guidelines.

INDEPENDENT ASSURANCE (continued)

ADHERENCE TO THE AA1000 PRINCIPLES

Inclusivity: *Does Hydro-Québec have a system that enables dialogue with stakeholders regarding aspects of sustainability?*

Hydro-Québec has a number of processes that show its commitment to dialogue with its stakeholders, regarding both projects and more general issues.

Materiality: *Does Hydro-Québec provide material information on the significant issues relating to its stakeholders' interests?*

The process used to determine the aspects to report appears to be consistent with the organization's significant issues and its stakeholders' interests. It is based on the Materiality Analysis conducted in fall 2014, to which 91 organizations and 57 Hydro-Québec managers and employees contributed.

Responsiveness: *Does Hydro-Québec have a system for responding to its stakeholders' concerns?*

In general, Hydro-Québec considers and responds to its stakeholders' concerns. The Report content has been reviewed to consider the results of the materiality matrix presented in this Report. The company also plans to conduct a responsiveness exercise with stakeholders in 2015.

Quantitative information and conclusion

According to our assurance process, the following items were observed:

- The systems and underlying processes used for managing and reporting sustainability information are reliable.
- The data selected for verification were on the whole obtainable and traceable, and the employees responsible at Hydro-Québec were able to demonstrate the origin, control methods and data interpretation in a satisfactory and transparent manner.
- The sustainability performance disclosures in the Report appropriately reflect the environmental, social and economic performance of Hydro-Québec over the period covered by the Report.

In conclusion, the assurance team considers that, based on the approach used, the information contained in the *Sustainability Report 2014* appears fair in all material respects and presents a reliable account of Hydro-Quebec's sustainability performance during the period.

Montreal, March 20, 2015

Isabelle Landry
Operations Manager, Certification of Systems and Laboratory Assessments
Bureau de normalisation du Quebec

GRI G4-24, G4-26

RELATIONS WITH STAKEHOLDERS

Owing to the nature of its operations, Hydro-Québec has a presence throughout the province and maintains ongoing relations with its numerous stakeholders. Good dialogue enables the company to preserve mutually beneficial relations, obtain support for important activities and even occasionally reconcile diverging interests.

STAKEHOLDERS	EXAMPLES OF SHARED SUSTAINABILITY GOALS	EXAMPLES OF MEANS USED	2014 RESULTS
Customers	■ Service quality and fairness for customers ■ Reliability of electricity service and supply ■ Customer satisfaction ■ Communications with cultural communities ■ Energy savings ■ Tailored collection services for low-income customers and those with payment difficulties	■ Table of customer expectations and survey of customer satisfaction ■ Handling of complaints and claims ■ Translation services during the collections process ■ Energy efficiency partnerships ■ Collections working group	■ Overall customer satisfaction (p. 54, 71) ■ Complaints and claims (p. 54, 71) ■ System average interruption duration index (p. 53, 71) ■ Generation portfolio (p. 35, 83) ■ Electricity purchases (p. 32–35) ■ Energy Efficiency Plan (p. 17, 29–30, 70) ■ Payment arrangements with low-income customers (p. 17, 55, 71)
Government authorities	■ Contribution to government strategies (e.g., Québec Energy Strategy, Government Sustainable Development Strategy, strategy to ensure the occupancy and vitality of territories, Québec's Agenda 21 for culture, etc.)	■ Partnerships and participation in joint committees ■ Company's strategic plan ■ Rollout of internal action plans	■ Sustainable Development Action Plan (p. 16–19) ■ Technological innovation (p. 56–58) ■ Climate change (p. 20–24) ■ Transportation electrification (p. 59)
Local and Aboriginal communities	■ Acceptability of projects ■ Harmonious integration of facilities into the environment ■ Respect for and preservation of local values and cultures ■ Social and economic development	■ Teams in charge of community and Aboriginal relations ■ Liaison committees with municipal associations ■ Support for local initiatives in connection with construction projects ■ Regional economic spinoffs committees	■ Progress of generation and transmission projects (p. 37–43) ■ Follow-up on projects in operation (p. 44–46) ■ Public participation (p. 47–49) ■ Hydro-Québec liaison committee with the Fédération québécoise des municipalités (p. 48) ■ Integrated Enhancement Program (p. 67–68, 71) ■ Regional economic spinoffs committees (p. 50–51)
Investors	■ Company profitability ■ Good governance ■ Risk management ■ Ethical behavior	■ Periodic meetings with investors ■ Dedicated Web site for investor relations ■ Annual Report ■ Codes of conduct	■ Financial results (p. 4, 36, 71) ■ Climate change (p. 20–24) ■ Codes of conduct (p. 14) ■ Contribution to the Québec economy (p. 50, 71)

GRI G4-24, G4-26

RELATIONS WITH STAKEHOLDERS (continued)

STAKEHOLDERS	EXAMPLES OF SHARED SUSTAINABILITY GOALS	EXAMPLES OF MEANS USED	2014 RESULTS
Educational institutions	■ Advancement of knowledge ■ Development of a skilled workforce ■ Education on key issues related to electricity	■ Support for universities ■ Partnerships and open innovation ■ Internships for university and college students ■ Knowledge sharing	■ Support for universities (p. 58, 71) ■ Funding of IEPE (p. 58, 65) ■ Number of internships (p. 65)
Non-governmental organizations	■ Establishment of mutually beneficial relationships	■ Working group with consumer associations ■ Various partnerships ■ Community investments ■ Liaison committee with the Union des producteurs agricoles (UPA) [Québec farm producers' union]	■ Working group with consumer associations (p. 55) ■ Liaison committee with the UPA (p. 48) ■ Transportation electrification (p. 59) ■ Community investments (p. 66–68)
General public	■ Public health and safety ■ Respect for the environment ■ Acceptability of projects ■ Social and economic development	■ Execution of studies and dissemination of information on public health and safety ■ Web site and toll-free line (1 800 363-7443) ■ Videos ■ Public consultation ■ Regional economic spinoffs committees ■ Satisfaction survey	■ Electric and magnetic fields (p. 60–62) ■ Information on radio-frequency emissions (p. 60–62) ■ Noise (p. 62) ■ Studies on mercury (p. 45, 60–62) ■ Security of facilities (p. 62–63) ■ Regional economic spinoffs committees (p. 50–51)
Suppliers	■ Sustainable procurement practices ■ Economic spinoffs in Québec ■ Ethical behavior	■ Participation in ECPAR, a group promoting sustainable procurement practices ■ Dedicated Web site for suppliers ■ Economic spinoffs committees ■ Code of conduct	■ Sustainable procurement (p. 14) ■ Centre de formation en entreprise et récupération [business and recycling training centres] (p. 26) ■ Procurement within Québec (p. 51, 71) ■ Economic spinoffs committees (p. 50–51)
Employees	■ Sustainability principles applied to daily activities ■ Healthy, safe work environment ■ Training and skills development	■ Sustainability awareness and training ■ Survey on employee engagement ■ Workplace health and safety committees	■ Work-related accident frequency (p. 63, 71) ■ Employee engagement (p. 64–65) ■ Hydro-Québec workforce (p. 64–65, 71)
Unions	■ Harmonious labor relations ■ Healthy and safe work environment	■ Training programs offered by the company and unions ■ Workplace health and safety committees	■ Collective agreements in effect (p. 65)

GRI G4-20, G4-21

MATERIALITY ANALYSIS – ASPECT DEFINITION AND BOUNDARIES

RANK	ASPECT	DEFINITION	BOUNDARY
1	Social acceptability of projects	Relations with local communities, including project-related information, consultation and engagement with stakeholders, as well as consideration of the concerns expressed	Mixed
2	Electricity supply	Distribution, transmission and generation system development, reliability, demand-side management, electricity surplus	Internal
3	Atmospheric emissions and impact of climate change	Management of atmospheric emissions related to Hydro-Québec operations (e.g., SO_2, NO_x), greenhouse gas and the impact of climate change on the organization (operating risk)	Mixed
4	Biodiversity management	Protection and restoration of protected areas, natural habitats and wildlife, and the impacts of operations on biodiversity and land	Mixed
5	Technological innovation	R&D leading to introduction of new technologies (e.g., energy efficiency, long-term operability of facilities, renewable energies, university partnerships, etc.)	Internal
6	Contribution to transportation electrification	Support for rollout of transportation electrification infrastructure (public transit and electric cars), as well as development and marketing of related new technologies (e.g., batteries, materials, electric motor systems, etc.)	Mixed
7	Public and consumer health and safety	Protection of the public and consumers, including facility and system security, introduction of emergency plans, compliance with public health standards (e.g., electric and magnetic fields, mercury in reservoirs)	External
8	Legal compliance	Compliance with laws and regulations, and Hydro-Québec contribution to government sustainability strategies	Mixed
9	Energy portfolio	Choice of energy options (conventional, emerging, self-generation), diversity of generation options and electricity supply, as well as their impact on rates	Mixed
10	Ethical management practices	Internal policies and practices that prevent risks of collusion, corruption and conflicts of interest	Internal
11	Water body management	Use of water bodies to generate electricity, including management of instream flows and the impacts of reservoirs (e.g., impact on navigation, etc.)	Mixed
12	Energy efficiency for customers	Support offered to customers to promote energy efficiency in their facilities (e.g., buildings, industrial systems, equipment, etc.)	External
13	Environmentally responsible management practices	Initiatives to improve the organization's performance, introduction of management systems (e.g., ISO 14001, OSHAS 18001 and BOMA BESt certification, etc.) and management of waste and hazardous materials (reduction, reuse, recycling, recovery)	Internal
14	Relations with Aboriginal communities	Relations with Aboriginal communities affected by or having an interest in projects or operations	External
15	Spinoffs of projects and operations	Direct and indirect economic impacts on local communities, from infrastructure investments, job creation, industrial tourism (visits to Hydro-Québec facilities)	External

GRI G4-20, G4-21

MATERIALITY ANALYSIS – ASPECT DEFINITION AND BOUNDARIES (continued)

RANK	ASPECT	DEFINITION	BOUNDARY
16	Land use	Management of generation, transmission and distribution impacts on land and landscape (undergrounding, access rights, obtaining servitudes, etc.)	External
17	Management of contaminated land	Management of leaks and spills into the environment, management of contaminated land	Mixed
18	Procurement practices	Local purchasing practices and responsible procurement, including selection of suppliers and materials, supplier evaluation and awareness, etc.	External
19	System energy efficiency	Measures implemented at Hydro-Québec to increase system efficiency and reduce system energy losses	Internal
20	Electricity exports	Electricity sales outside the province (e.g. to the United States), specifically the quantity exported and its profitability	Internal
21	Universal access to service	Practices and programs for low-income customers and those with payment difficulties, and service development programs for isolated communities	External
22	Electricity prices	Development of rate grids and changes in electricity prices for different customer categories (residential, small-, medium- and large-power customers)	External
23	Community investments	Philanthropic programs including donations and sponsorships, employee volunteering, fundraising campaigns and the Integrated Enhancement Program	Mixed
24	Financial viability	The organization's financial performance, risk management and internal efficiency programs (e.g., optimization of administrative processes, etc.)	Internal
25	Employee health and safety	Programs to support the social, psychological and physical health of Hydro-Québec employees	Internal
26	Relations with governments	Organization's positioning with government institutions and their representatives (e.g., Régie de l'énergie, Bureau d'audiences publiques sur l'environnement, NERC, FERC, etc.)	Mixed
27	Vegetation control	Vegetation management in facility rights-of-way (transmission lines, dikes, dams, distribution system, etc.) to maintain system security and reliability	Internal
28	Customer service	Assistance available to consumers by e-mail or telephone (e.g., when outages occur, to answer questions, etc.)	External
29	Heritage management	Programs to protect and enhance built, technological, natural and archaeological heritage, and promote public awareness	Mixed
30	Diversity and equal opportunity	Internal practices and policies relating to equal opportunity for employees (compensation, recruitment, training, promotions), recognition and respect for diversity of individuals and opinions	Internal
31	Measurement of consumption	Rollout of an advanced metering infrastructure (next-generation meters) to improve billing service and outage detection	Mixed

GRI G4-20, G4-21

MATERIALITY ANALYSIS – ASPECT DEFINITION AND BOUNDARIES (continued)

RANK	ASPECT	DEFINITION	BOUNDARY
32	Information management	Internal policies and practices on protection of personal information and access to information	Mixed
33	Jobs and working conditions	Information on the workforce and all benefits negotiated or granted to employees (compensation, benefits)	Internal
34	Training and skills development	Training offered to employees as well as skills development and succession management programs	Internal

MAJOR FACILITIES AND GENERATING STATIONS SERVING OFF-GRID SYSTEMS

Generating station rated 300 MW or more	●	Hydro
	▲	Thermal
Off-grid generating station	●	Diesel-powered thermal
	●	Hydro
Other facilities	○	Generating station under construction
	■	735-kV substation
	——	735-kV line
	- - -	450-kV direct-current line
	⊷	Interconnection
	85 MW	Export capacity
	—o—	Neighboring system (simplified)

SHARE YOUR COMMENTS WITH US

We would like to know what you think of our report. Please submit your questions and comments.

UNITS OF MEASURE

¢/kWh	cent or $0.01 per kilowatthour
$'000	thousands of dollars
$M	millions of dollars
$B	billions of dollars
V	volt (a unit for measuring voltage)
kV	kilovolt (one thousand volts)
W	watt (a unit for measuring power)
kW	kilowatt (one thousand watts)
MW	megawatt (one million watts)
GW	gigawatt (one billion watts)
Wh	watthour (a unit for measuring electric energy)
kWh	kilowatthour (one thousand watthours)
MWh	megawatthour (one million watthours)
GWh	gigawatthour (one billion watthours)
TWh	terawatthour (one trillion watthours)
MMBtu	million British thermal units
t	tonne (metric ton)
g CO_2 eq.	gram of CO_2 equivalent
t CO_2 eq.	tonne of CO_2 equivalent
kt CO_2 eq.	one thousand tonnes of CO_2 equivalent
Mtoe	million TOE, million tonnes of oil equivalent

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